hp color LaserJet 4600/4610n/4650

invent

service

HP Color LaserJet 4600 Series printer

Service Manual

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Safety Information

WARNING!

Potential Shock Hazard

Always follow basic safety precautions when using this product to reduce the risk of injury from fire or electric shock.

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1 Product information

This chapter contains information about the following topics:

- Model configurations
- Printer features
- Printer assemblies
- Identification, site requirements, and specifications
- Print media
- Environmental product stewardship program
- Hewlett-Packard limited warranty statement
- Declaration of conformity
- Country/region laser safety statements
- Japan power-cord statement

Model configurations

This manual describes the HP Color LaserJet 4600 models, the HP Color LaserJet 4610n model, and the HP Color LaserJet 4650 models, which are referred to collectively as the HP Color LaserJet 4600 Series printers.

HP Color LaserJet 4600 Series printer

The following figures and table show the configuration for the various models of HP Color LaserJet 4600 Series printer. The HP Color LaserJet 4600 printer and the HP Color LaserJet 4650 printer each come in five models.

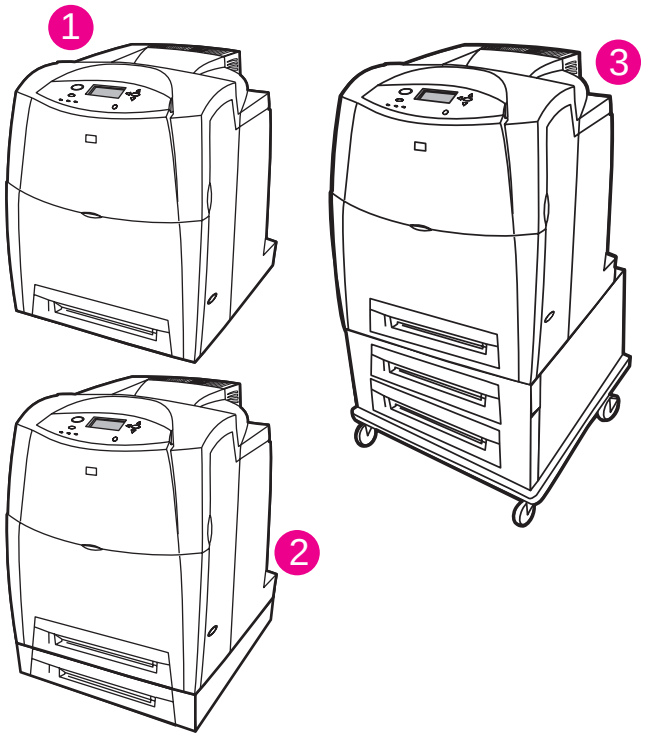


Figure 1-1 HP CLJ 4600 Series printers

1	HP Color LaserJet 4600, 4600n, 4600dn, 4650, 4650n, and 4650dn printer and the HP Color LaserJet 4610n printer
2	HP Color LaserJet 4600dtn, 4600hdn, and 4650dtn printer
3	HP Color LaserJet 4650hdn printer

Table 1-1 HP Color LaserJet 4600 model configurations

Base model: HP Color LaserJet 4600 printer (product number C9660A)	The HP CLJ 4600 printer is the base model, which includes 96 megabytes (MB) of synchronous dynamic random access memory (SDRAM) and one 500-sheet input tray. Callout 1 in Figure 1-1 HP CLJ 4600 Series printers shows the HP Color LaserJet 4600 printer.

Table 1-1 HP Color LaserJet 4600 model configurations (continued)

HP Color LaserJet 4600n printer (product number C9692A)	The HP CLJ 4600n printer includes all of the features of the base model plus an HP Jetdirect 610n print server (network card). Callout 1 in Figure 1-1 HP CLJ 4600 Series printers shows the HP Color LaserJet 4600n printer.
HP Color LaserJet 4600dn printer (product number C9661A)	The HP CLJ 4600dn printer includes all of the features of the base model plus an HP Jetdirect 610n print server (network card), automatic 2-sided printing (duplexing), an additional 500-sheet feeder, and 96 MB of SDRAM. Callout 1 in Figure 1-1 HP CLJ 4600 Series printers shows the HP Color LaserJet 4600dn printer.
HP Color LaserJet 4600dtn printer (product number C9662A)	The HP CLJ 4600dtn printer includes all of the features of the base model plus an HP Jetdirect 610n print server (network card) and automatic 2-sided printing (duplexing), an additional 500-sheet feeder, and 160 MB of SDRAM. Callout 2 in Figure 1-1 HP CLJ 4600 Series printers shows the HP Color LaserJet 4600dtn printer.
HP Color LaserJet 4600hdn printer (product number C9663A)	The HP CLJ 4600hdn printer includes all of the features of the base model with an HP Jetdirect 610n print server (network card) and automatic 2-sided printing (duplexing), an additional 500-sheet feeder, a hard disk, and 160 MB of SDRAM. Callout 2 in Figure 1-1 HP CLJ 4600 Series printers shows the HP Color LaserJet 4600hdn printer.

Table 1-2 HP Color LaserJet 4610n printer

HP Color LaserJet 4610n printer (product number Q7732A)	The HP CLJ 4610n includes 128 MB of dual-data-rate (DDR) SDRAM plus 32 MB of additional memory on the formatter board for a total of 160 MB of memory. This model includes a 500-sheet input tray. The printer also includes an HP Jetdirect 175x external print server that is connected to the USB port. It also has an IEEE-compliant parallel connection. Callout 1 in Figure 1-1 HP CLJ 4600 Series printers shows the HP Color LaserJet 4610n printer.

Table 1-3 HP Color LaserJet 4650 model configurations

Base model: HP Color LaserJet 4650 printer (product number Q3668A)	The HP CLJ 4650 printer is the base model, which includes 128 MB of DDR SDRAM, plus 32 MB of additional memory on the formatter board for a total of 160 MB of memory, and a 500-sheet input tray. The printer provides three enhanced input/output (EIO) slots, wireless connectivity, an auxiliary port, a universal serial bus (USB) connection, and a standard bidirectional parallel cable interface (IEEE-1284-C compliant). Callout 1 in Figure 1-1 HP CLJ 4600 Series printers shows the HP Color LaserJet 4650 printer.

Table 1-3 HP Color LaserJet 4650 model configurations (continued)

HP Color LaserJet 4650n printer (product number Q3669A)	The HP CLJ 4650n printer includes all of the features of the base model plus an HP Jetdirect 620n print server (network card). Callout 1 in Figure 1-1 HP CLJ 4600 Series printers shows the HP Color LaserJet 4650n printer.
HP Color LaserJet 4650dn printer (product number Q3670A)	The HP CLJ 4650dn printer includes all of the features of the base model plus an HP Jetdirect 620n print server (network card) and automatic 2-sided printing (duplexing). Callout 1 in Figure 1-1 HP CLJ 4600 Series printers shows the HP Color LaserJet 4650dn printer.
HP Color LaserJet 4650dtn printer (product number Q3671A)	The HP CLJ 4650dtn printer includes all of the features of the base model plus an HP Jetdirect 620n print server (network card), automatic 2-sided printing (duplexing), an additional 500-sheet feeder. This model has 256 MB of DDR SDRAM, plus 32 MB of additional memory on the formatter board for a total of 288 MB of memory. Callout 2 in Figure 1-1 HP CLJ 4600 Series printers shows the HP Color LaserJet 4650dtn printer.
HP Color LaserJet 4650hdn printer (product number Q3672A)	The HP CLJ 4650hdn printer includes all of the features of the base model plus an HP Jetdirect 620n print server (network card), automatic 2-sided printing (duplexing), a 2 x 500-sheet feeder, and a hard drive. This model has 256 MB of DDR SDRAM, plus 32 MB of additional memory on the formatter board for a total of 288 MB of memory. Callout 3 in Figure 1-1 HP CLJ 4600 Series printers shows the HP Color LaserJet 4650hdn printer.

Printer features

This printer combines the quality and reliability of HP printing with the following features. For more information about printer features, go to one of the following Web sites:

- HP Color LaserJet 4600 models: www.hp.com/support/clj4600
- HP Color LaserJet 4610n printer: www.hp.com/support/clj4610
- HP Color LaserJet 4650 models: www.hp.com/support/clj4650

Printer features

Table 1-4 Printer features

Feature	Description
Performance	■ **HP Color LaserJet 4600 models**: 17 pages per minute (ppm) on letter-sized paper, 16 ppm on A4-sized paper. ■ **HP Color LaserJet 4610n and 4650 models**: 22 ppm on letter-sized and A4-sized paper. ■ All models print on transparencies and glossy paper.
Memory	For information about printer memory, see Table 1-1 HP Color LaserJet 4600 model configurations.
User interface	■ Graphical display on the control panel. ■ Enhanced Help with animated graphics. ■ Embedded Web server to gain access to support and to order supplies (on network-connected HP CLJ 4600 and 4650 models only). ■ **HP CLJ 4650 models**: HP LaserJet Toolbox software to provide printer status and alerts, configure printer settings, view documentation and troubleshooting information, and print internal printer information pages.
Supported printer personalities	■ HP PCL 6. ■ HP PCL 5c. ■ PostScript® 3 emulation (PS). ■ Automatic language switching. ■ **HP CLJ 4610n and 4650 models**: Portable document format (PDF).
Storage features	■ Job storage (only for HP CLJ 4600 and 4650 models that contain hard disks). ■ Fonts and forms. ■ Personal identification number (PIN) printing (for printers that contain hard disks).

Table 1-4 Printer features (continued)

Feature	Description
Environmental features	■ PowerSave setting. ■ High content of recyclable components and materials. ■ ENERGY STAR® compliant.
Fonts	■ 80 internal fonts are available for both PCL and PostScript emulation. ■ 80 printer-matching screen fonts in TrueType format are available with the software solution. ■ HP Web Jetadmin supports forms and fonts on the disk.
Paper handling	■ Prints on media from 77 mm x 127 mm (3 inches x 5 inches) up to legal size (216 mm x 355 mm; 8.5 inches x 14 inches). ■ **HP Color LaserJet 4600 models**: Prints on media of weights from 60 g/m^2 to 176 g/m^2 (16 lb to 47 lb). ■ **HP Color LaserJet 4610n and 4650 models**: Prints on media of weights from 60 g/m^2 to 199 g/m^2 (16 lb to 53 lb). ■ Prints on a wide range of media types including glossy, labels, overhead transparencies, and envelopes. ■ Accepts multiple gloss levels. ■ Includes a 500-sheet input tray (tray 2) that supports letter-, legal-, executive-, JIS B5-, A4-, A5-, and custom-size media. ■ An optional 500-sheet paper feeder (tray 3) that supports letter-, legal-, executive-, JIS B5-, A4-, A5-, and custom-size media (the tray is standard on HP Color LaserJet 4600dtn, 4600hdn, and 4650dtn printers). **NOTE** The optional 500-sheet paper feeder is available only for the HP Color LaserJet 4600 and 4650 models. ■ An optional 2 x 500-sheet paper feeder (tray 3/tray 4) that supports letter-, legal-, executive-, JIS B5-, 16K-, A4-, A5-, and custom-size media (the tray is standard on the HP Color LaserJet 4650hdn printer). **NOTE** The 2 x 500-sheet feeder is available only for the HP Color LaserJet 4650 models. ■ Includes built-in 2-sided printing on the HP Color LaserJet 4600dn, 4600dtn, 4600hdn, 4650dn, 4650dtn, and 4650hdn printers (not included with the HP Color LaserJet 4610n printer). ■ Includes a 250-sheet face-down output bin.

Table 1-4 Printer features (continued)

Feature	Description
Accessories	■ Printer hard disk, which provides storage for fonts and macros as well as job storage. To determine if your model contains a hard disk, see Model configurations. **NOTE** The hard disk is standard on the HP Color LaserJet 4600hdn and 4650hdn printers. It is *not* available for the HP Color LaserJet 4610n printer.) ■ **HP CLJ 4600 models**: Dual inline memory modules (DIMMs). ■ **HP CLJ 4610n and 4650 models**: 32 MB CompactFlash memory (with firmware). ■ Printer stand. ■ Optional 500-sheet paper feeder (tray 3) that supports letter-, legal-, executive-, JIS B5-, A4-, A5-, and custom-size media. **NOTE** The feeder is standard on HP Color LaserJet 4600dtn, 4600hdn, and 4650dtn printers. It is *not* available for the HP Color LaserJet 4610n printer. ■ **HP CLJ 4650 models**: Optional 2 x 500-sheet paper feeder (tray 3/4) that supports letter-, legal-, executive-, JIS B5-, A4-, A5-, and custom-size media. **NOTE** The feeder is standard on the HP Color LaserJet 4650hdn printer. It is *not* available for the HP CLJ 4600 models or the HP CLJ 4610n printer. ■ **HP CLJ 4600 models**: Fast InfraRed (FIR) pod. ■ **HP CLJ 4610n model**: One 200-pin DDR SDRAM slot for upgrading the printer memory. The DDR SDRAM memory is available in 128, 256, and 512 MB modules. ■ **HP CLJ 4650 models**: Two 200-pin DDR SDRAM slots. One slot is available for adding memory to the printer. The DDR SDRAM memory is available in 128 and 256 MB modules.
Connectivity	■ Optional enhanced input/output (EIO) network card. **NOTE** The network card is standard on HP Color LaserJet 4600n, 4600dn, 4600dtn, 4600hdn, 4650n, 4650dn, 4650dtn, and 4650hdn printers. It is *not* available for the HP Color LaserJet 4610n printer. ■ Fast InfraRed (FIR) connection (HP CLJ 4600 models only). ■ HP Web Jetadmin software (www.hp.com/go/wegjetadmin_software). ■ Standard bidirectional parallel cable interface (IEEE-1284 compliant). ■ **HP CLJ 4650 models**: Auxiliary connector. ■ **HP CLJ 4610n and 4650 models**: USB 1.1 connection.

Table 1-4 Printer features (continued)

Feature	Description
	NOTE **HP Color LaserJet 4610n and 4650 models**: Both USB and parallel connections are supported, but they cannot be used at the same time.
Supplies	■ A supplies-status page contains information about toner level, page count, and estimated pages remaining. ■ Cartridges feature a no-shake design. ■ The printer checks for authentic HP print cartridges at cartridge installation. ■ **HP Color LaserJet 4600 and 4650 models**: Internet-enabled supply-ordering capabilities (by using the embedded Web server).

Printer assemblies

HP Color LaserJet 4600 models

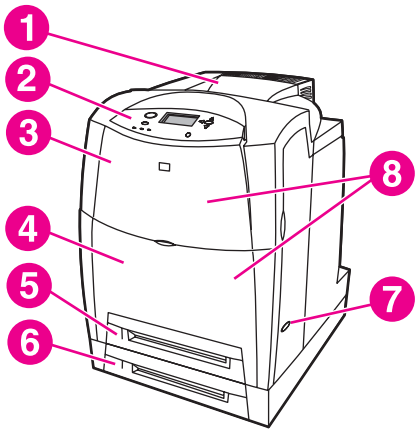


Figure 1-2 Front view, HP Color LaserJet 4600 models

1	Output bin
2	Printer control panel
3	Top cover
4	Front cover (includes tray 1)
5	Tray 2 (500-sheet standard tray)
6	Tray 3 (500-sheet paper feeder; optional)
7	On/off switch
8	Access to print cartridge, transfer unit, and fuser

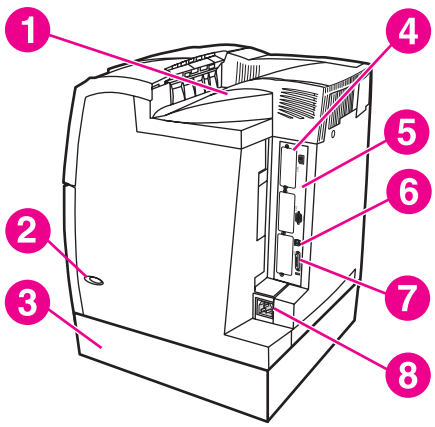


Figure 1-3 Back view, HP Color LaserJet 4600 models

1	Output bin

2	On/off switch
3	Tray 3 500-sheet paper feeder (optional)
4	EIO connections (3 total)
5	Memory access
6	Fast InfraRed (FIR) connection
7	Parallel connection
8	Power connection

HP Color LaserJet 4610n printer

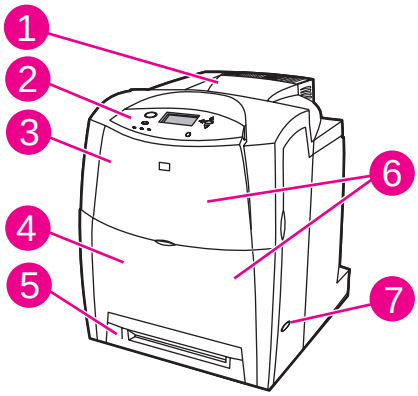


Figure 1-4 Front view, HP Color LaserJet 4610n printer

1	Output bin
2	Printer control panel
3	Top cover
4	Front cover (includes tray 1)
5	Tray 2 (500–sheet standard tray)
6	Access to print cartridges, transfer unit, and fuser
7	On/off switch

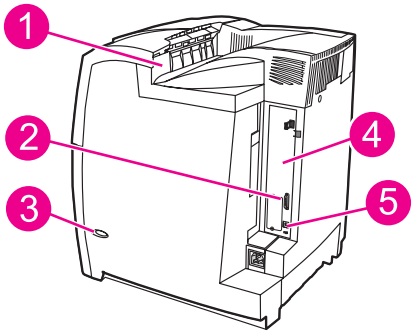


Figure 1-5 Back view, HP Color LaserJet 4610n printer

1	Output bin
2	Parallel connection
3	On/off switch
4	Memory access
5	1.1 USB connection

HP Color LaserJet 4650 models

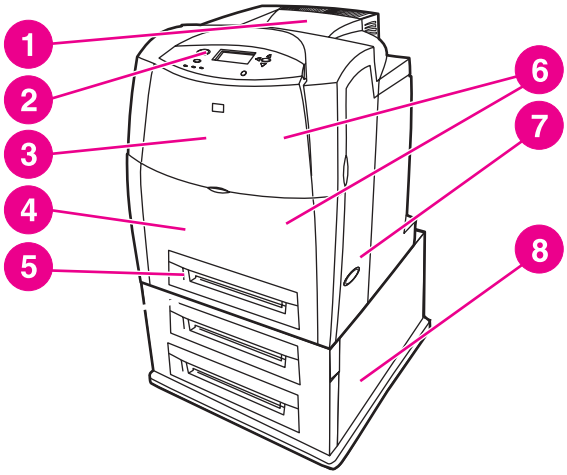


Figure 1-6 Front view, HP Color LaserJet 4650 models

1	Output bin
2	Printer control panel
3	Top cover
4	Front cover (includes tray 1)
5	Tray 2 (500-sheet standard tray)
6	Access to print cartridges, transfer unit, and fuser

7	On/off switch
8	Tray 3/tray 4 (optional)

NOTE The optional 500-sheet paper feeder (tray 3) and the optional 2 x 500-sheet input tray (tray 3 and tray 4) cannot be installed in the printer at the same time.

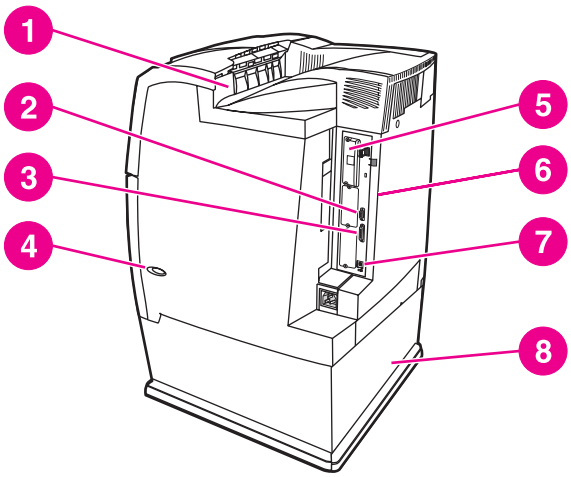


Figure 1-7 Back view, HP Color LaserJet 4650 models

1	Output bin
2	Auxiliary connector
3	Parallel connection
4	On/off switch
5	EIO connection (3 total)
6	Memory access
7	1.1 USB connection
8	Tray 3/tray 4 (optional)

Identification, site requirements, and specifications

The following sections describes printer identification, site requirements, and specifications.

Model and serial numbers

The model number and serial numbers are listed on identification labels located on the rear of the printer. The model number is alphanumeric, such as C9660A for an HP Color LaserJet 4600 printer. The serial number contains information about the country/region of origin, the printer version, production code, and the production number of the printer.

NOTE This manual describes the HP Color LaserJet 4600 Series printer, including the HP Color LaserJet 4600 models, the HP Color LaserJet 4610n printer, *and* the HP Color LaserJet 4650 models.

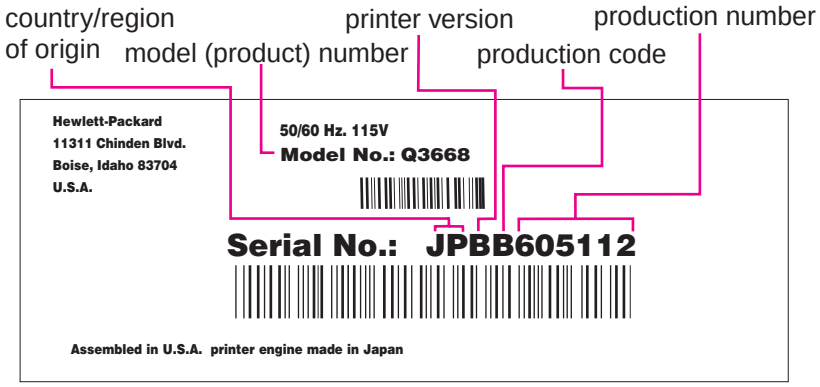


Figure 1-8 Model and serial number label

Model name	Product/model number
HP Color LaserJet 4600	C9660A
HP Color LaserJet 4650	Q3668A
HP Color LaserJet 4600n	C9692A
HP Color LaserJet 4610n	Q7732A
HP Color LaserJet 4650n	Q3669A
HP Color LaserJet 4600dn	C9661A
HP Color LaserJet 4650dn	Q3670A
HP Color LaserJet 4600dtn	C9662A
HP Color LaserJet 4650dtn	Q3671A
HP Color LaserJet 4600hdn	C9663A
HP Color LaserJet 4650hdn	Q3672A

Power and regulatory label

The identification labels on the rear of the printer also contain power-rating and regulatory information.

CAUTION Converting the voltage on the printer can damage the printer. Do not use any voltage other than the operating voltage. Any attempt to convert operating voltages will void the product warranty (for example, attempting to change a 110 V printer to a 220 V printer).

Figure 1-9 Power and regulatory label

Site requirements

The printer must be kept in an appropriate location to maintain the performance level that has been set at the factory. In particular, be sure that the environment adheres to the specifications listed in this chapter.

The following are recommendations for the printer location and placement.

Make sure that the printer installation location has the following attributes:

- A well-ventilated, dust-free area
- A hard, level surface (with not more than a 2° angle)
  - For the HP Color LaserJet 4600, 4600n, and 4600dn, the surface must support at least 37 kg (81 lb).
  - For the HP Color LaserJet 4600dtn and 4600hdn, the surface must support at least 44 kg (97 lb).
  - For the HP Color LaserJet 4610n, the surface must support at least 36 kg (80 lb).
  - For the HP Color LaserJet 4650, 4650n, and 4650dn, the surface must support at least 36 kg (80 lb).
  - For the HP Color LaserJet 4650dtn, the surface must support at least 44 kg (97 lb).
- A level surface that supports all four corners of the printer
- A constant temperature and humidity (not near water sources, humidifiers, air conditioners, refrigerators, or other major appliances).

CAUTION The HP Color LaserJet 4650hdn must *not* be installed on an elevated surface. Always install the HP CLJ 4650hdn printer on a hard, level floor.

Make sure to keep the printer away from the following environmental features:

- Direct sunlight, dust, open flames, or water
- The direct flow of exhaust from air ventilation systems
- Magnets and devices that emit a magnetic field
- Areas that experience vibration
- Walls or other objects

Space requirements

The HP Color LaserJet 4600 Series printers must have the following clearance space.

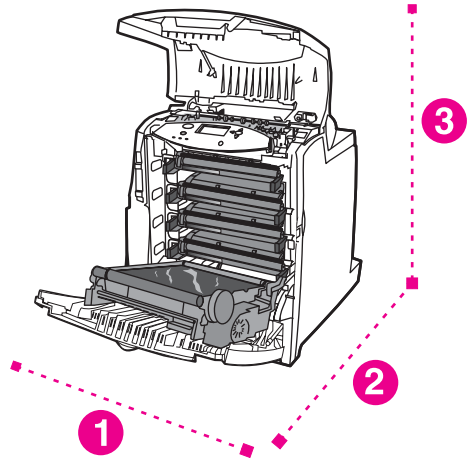


Figure 1-10 Space requirements for the HP Color LaserJet 4600 Series printer (except for the HP Color LaserJet 4600dtn/4600hdn/4650dtn/4650hdn printer)

1	530 mm (20.9 inches)
2	1294 mm (50.9 inches)
3	804 mm (31.7 inches) **NOTE** More vertical space is required for models that have additional trays.

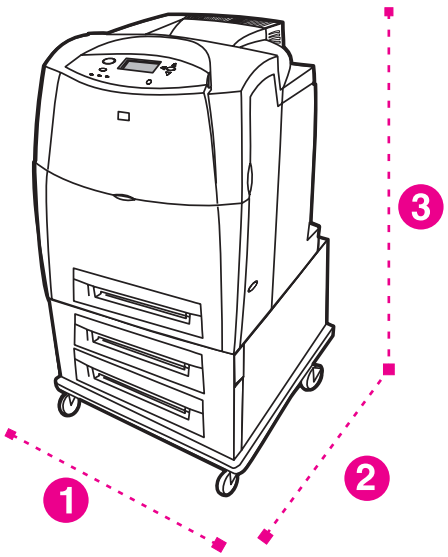


Figure 1-11 Space requirements for the HP Color LaserJet 4650hdn printer

1	530 mm (20.9 inches)

2	1294 mm (50.9 inches)
3	1373 mm (54.1 inches)

Physical specifications

Product	Height	Depth	Width	Weight
HP Color LaserJet 4600, 4600n, 4600dn, 4610n, 4650, 4650n, and 4650dn printers	566 mm (22.3 inches)	480 mm (18.9 inches)	456 mm (18.0 inches)	37 kg (81.6 lbs)
HP Color LaserJet 4600dtn, 4600hdn, and 4650dtn printers	654 mm (25.7 inches)	480 mm (18.9 inches)	456 mm (18.0 inches)	44 kg (97.0 lbs)
HP Color LaserJet 4650hdn printer	1035 mm (40.7 inches)	645 mm (25.4 inches)	460 mm (18.1 inches)	66 kg (146.6 lbs)

Electrical specifications

WARNING! Power requirements are based on the country/region where the printer is sold. Do not convert operating voltages. This can damage the printer and void the product warranty.

Table 1-5 Power requirements for the HP Color LaserJet 4600 models

Item	110-volt models	220-volt models
Power requirements	100–127 V (-10%, +6%) 50/60 Hz (+/-2 Hz)	220–240 V (-10%, +6%) 50/60 Hz (+/-2 Hz)
Rated current	6 amps	3 amps

Table 1-6 Power requirements for the HP Color LaserJet 4610n and 4650 models

Item	110-volt models	220-volt models
Power requirements	100–127 V (+/-10%) 50/60 Hz (+/-2 Hz)	220–240 V (+/-10%) 50/60 Hz (+/-2 Hz)
Rated current	6 amps	3 amps

Table 1-7 Power consumption, average (in watts)[1]

Product model[3], [3] Product model[34]	Printing[4]	Ready[4]	PowerSave	Off
HP Color LaserJet 4600 models (110 volt models)	426 W	34 W	30 W	0 W
HP Color LaserJet 4600 models (220 volt models)	430 W	36 W	32 W	0 W
HP Color LaserJet 4610n and 4650 models (except HP Color LaserJet 4650hdn printer)	560 W	38 W	26 W	0.3 W
HP Color LaserJet 4650hdn printer	560 W	40 W	31 W	0.3 W

1 Values are subject to change. See www.hp.com/support/clj4600, www.hp.com/support/clj4610, or www.hp.com/support/clj4650 for current information. The PowerSave default activation time is 30 minutes.
2 Power reported is highest value measured for color and monochrome printing using all standard voltages.
3 Default time from Ready mode to PowerSave = 30 minutes.
4 Maximum heat dissipation for all models in Ready mode = 137 BTU/Hour.

Environmental specifications

Specification	Recommended	Allowed
Temperature	17 to 25°C (62.6 to 77°F)	10 to 30°C (50 to 86°F)
Humidity	30 to 70% relative humidity (RH)	10 to 80% RH
Altitude	not applicable	0 to 2600 m (0 to 8530 ft)

Acoustic emissions

Sound Power Level [1] (SPL)	**Declared Per ISO 9296**
Active (22 ppm letter)	L_{WAd}=6.5 Bels (A) [65 dB (A)]
Idle	L_{WAd}=5.0 Bels (A) [50 dB (A)]
SPL - Bystander Position	**Declared Per ISO 9296**
Active (22 ppm letter)	L_{pAm}=51 dB (A)
Idle	L_{pAm}=34 dB (A)

1 Values are subject to change. See www.hp.com/support/clj4600, www.hp.com/support/clj4610, or www.hp.com/support/clj4650 for current information. The PowerSave default activation time is 30 minutes.

Supply storage requirements

The life of supplies is greatly affected by their storage environment. Use storage requirements to determine the shelf life of stored supplies.

Table 1-8 Supply storage requirements

Item	Storage time	Storage condition
Temperature	Normal (maximum of 2.5 years)	0° to 35°C (32° to 95°F)
	Severe (maximum of 18 days)	High 35° to 40°C (95° to 104°F) Low 0° to -20°C (32° to -4°F)
	Maximum temperature change rate	40° to 15°C (104° to 59°F) within 3 minutes -20° to 25°C (-4° to 77°F) within 3 minutes
Humidity	Normal (maximum of 2.5 years)	35% to 85% RH
	Severe (maximum of 18 days)	High 85% to 95% RH Low 10% to 35% RH
	Atmospheric pressure	460 to 760 mm Hg (18.1 to 29.9 inches Hg)
	Storage time[1]	2.5 years

[1] The average storage time includes use time. Use cartridges within 2.5 years of the date code on the cartridge.

Print media

The following sections describe print media that can be used in the HP Color LaserJet 4600 Series printer.

Print-media specifications

For optimum results, use conventional 75-g/m^2 (20-lb) photocopy paper. Verify that the paper is of good quality and is free of cuts, nicks, tears, spots, loose particles, dust, wrinkles, curls, or bent edges.

- To order supplies in the U.S., go to www.hp.com/go/ljsupplies.
- To order supplies worldwide, go to www.hp.com/ghp/buyonline.html.
- To order accessories, go to www.hp.com.
- For additional information about supported media weights and sizes, go to www.hp.com/support/ljpaperguide.

The following table contains information about the types of print media that are supported for the various paper-handling features.

Table 1-9 Supported media specifications

Tray	Supported media	Media specifications	Capacity
Tray 1	Paper A4/Letter, Legal, Executive, JIS, B5, A5, Custom Minimum size: 76 x 127 mm (3 x 5 in) Maximum size: 216 x 356 mm (8.5 x 14 in)	**HP Color LaserJet 4600 models**: 60 to 176 g/m^2 (16 to 47 lb) **HP Color LaserJet 4610n and 4650 models**: 60 to 199 g/m^2 (16 to 53 lb)	100 sheets of 75-g/m^2 (20-lb) paper. Do not load more than the maximum stack height of 10 mm (0.6 in)
	Transparencies A4/Letter	0.13 mm (5 mil)	Maximum stack height of 10 mm (0.6 in)
	Glossy film A4/Letter, Legal, Executive, JIS, B5, A5, Custom Minimum size: 76 x 127 mm (3 x 5 in) Maximum size: 216 x 356 mm (8.5 x 14 in)	0.13 mm (5 mil)	Maximum stack height of 10 mm (0.6 in)
	Glossy paper A4/Letter, Legal, Executive, JIS, B5, A5, Custom Minimum size: 76 x 127 mm (3 x 5 in) Maximum size: 216 x 356 mm (8.5 x 14 in)	75-g/m^2 to 120-g/m^2(20-lb to 32-lb)	maximum stack height of 10 mm (0.6 in)
	Envelopes Com10, Monarch, C5, DL, B5	Maximum weight: 105-g/m^2 (28-lb bond)	Limit of 20

Table 1-9 Supported media specifications (continued)

Tray	Supported media	Media specifications	Capacity
	Labels[1] A4/Letter, Legal, Executive, JIS, B5, A5, Custom Minimum size: 76 x 127 mm (3 x 5 in). Maximum size: 216 x 356 mm (8.5 x 14 in)		Do not load more than the maximum stack height of 10 mm (0.6 in)
Tray 2 (included for all models) Optional tray 3 (available for the HP CLJ 4600 and 4650 models) Optional tray 3/tray4 (the 2 x 500-sheet paper feeder is only available for the HP CLJ 4650 models) [2] [3]	Paper A4/Letter, Legal, Executive, JIS, B5, A5, Custom Minimum size: 148 x 210 mm (5.8 x 8.2 in). Maximum size: 216 x 356 mm (8.5 x 14 in)	60- to 105-g/m^2(16- to 28-lb)	500 sheets of 75-g/m^2 (20–lb) paper. Maximum stack height of 50 mm (2 inches)
	Transparencies A4/Letter	0.13 mm (5 mil)	Limit of 100 sheets
	Glossy film A4/Letter, Legal, Executive, JIS, B5, A5, Custom Minimum size: 148 x 210 mm (5.8 x 8.2 in). Maximum size: 216 x 356 mm (8.5 x 14 in)	0.13 mm (5 mil)	Limit of 100 sheets
	Glossy paper A4/Letter, Legal, Executive, JIS, B5, A5, Custom Minimum size: 148 x 210 mm (5.8 x 8.2 in). Maximum size: 216 x 356 mm (8.5 x 14 in)	75-g/m^2 to 120-g/m^2 (20-lb to 32-lb)	Limit of 200 sheets
Duplex printing	Paper, glossy paper A4/Letter, Legal, Executive, JIS, B5, A5, Custom Custom paper sizes are not supported for 2-sided printing.	75-g/m^2 to 105-g/m^2 (20-lb to 28-lb)	

1 Tray 1 only.
2 Tray 2, tray 3, and tray 3/tray 4 do not support the range of custom sizes that tray 1 does.
3 Tray 2, tray 3, and tray 3/tray 4 use custom size, specifically for B5 ISO.

NOTE Use only HP-supported transparencies (HP part number C2934A, Letter size; C2936A, A4 size).

Media to avoid

This printer can handle many types of media. Using media outside the printer's specifications will cause a loss of print quality and increase the incidence of jams.

- Do not use paper that is too rough.
- Do not use paper that contains cutouts or perforations other than standard three-hole punched paper.
- Do not use multipart forms.
- Do not use paper that has already been printed on or fed through a photocopier or printer.
- Do not use paper that contains a watermark if you are printing solid patterns.

Media that can cause damage to the printer

In rare circumstances media can damage the printer. To prevent possible damage, do not use the following media:

- Do not use paper that is embossed or coated unless it is specifically recommended for use in this printer.
- Do not use paper that contains irregularities such as tabs or staples.
- Do not use letterhead paper that was produced by using low temperature dyes or thermography. Preprinted forms or letterhead must use inks that can tolerate 190°C (374°F) for 0.1 second.
- Do not use any media that produces hazardous emissions, or that melts, offsets, or discolors when exposed to 190°C (374°F) for 0.1 second.
- Do not use transparencies that are designed for use with Inkjet printers or other low-temperature printers. Use only transparencies that are specified for use with HP Color LaserJet printers.

Printing on special media

Use these guidelines when printing on special types of media.

- For optimum results, use conventional 75-g/m^2 (20-lb) xerographic paper.
- Verify that the paper is of good quality and free of cuts, nicks, tears, spots, loose particles, dust, wrinkles, curls, or bent edges.

NOTE Special media such as envelopes, transparencies, custom-size paper, or media that is heavier than 120-g/m^2 should be fed only from tray 1.

To print on any special media, use the following procedure.

1 Load the media in a tray.

2 When the printer prompts you for the paper type, select the correct media type for the media that is loaded in the tray. For example, select **HIGH GLOSS** (HP Color LaserJet 4650 models only) when loading high-gloss laser paper.

3 In the software program or the printer driver, set the media type to match the media type that is loaded in the tray.

NOTE For the best print quality, always verify that the media type that is selected on the printer control panel and the media type that is selected in the software program or printer driver match the type of media that is loaded in the tray.

Transparencies

When printing on transparencies, use the following guidelines:

- Handle transparencies by the edges. Oils from your fingers that are deposited on the transparency can cause print-quality problems.
- Use only overhead transparencies that are recommended for use in this printer. Hewlett-Packard Company recommends using HP Color LaserJet Transparencies with this printer. HP products are designed to work together for optimum printing results.
- In either the software program or the driver, select **TRANSPARENCY** as the media type, or print from a tray that is configured for transparencies.

CAUTION Transparencies that are not designed for LaserJet printing will melt in the printer, causing damage to the printer.

Table 1-10 Printing on transparencies

Description	Specifications
Electrical surface resistivity	2.0 to 15 ohms by 10 ohms per square inch.
Fusing compatibility	Materials must not discolor, melt, offset, or release hazardous emissions when heated to 190ºC (374ºF) for 0.1 second.
Caliper (thickness)	0.12 mm (0.0048 inch) to 0.13 mm (0.0052 inch).

Glossy paper

- In either the software program or the driver, select **GLOSSY**, **HEAVY**, or **HIGH GLOSS** (HP Color LaserJet 4650 models only) as the media type, or print from a tray that is configured for glossy paper.
- Use the control panel to set the media type to **GLOSSY** for the input tray that is being used.
- Because this setting affects all print jobs, return the printer to its original settings after the job has printed.

NOTE Hewlett-Packard Company recommends using HP Color LaserJet High Gloss paper with the HP Color LaserJet 4650 printer. HP products are designed to work together for optimum printing results. If HP Color LaserJet High Gloss paper is not used with the printer, print quality might be compromised.

Colored paper

- Colored paper should be of the same high quality as white xerographic paper.
- Pigments used must be able to withstand the printer's fusing temperature of 190°C (374°F) for 0.1 second without deterioration.
- Do not use paper that contains a colored coating that was added after the paper was produced.
- The printer creates colors by printing patterns of dots, overlaying and varying their spacing to produce various colors. Varying the shade or color of the paper will affect the shades of the printed colors.

Printing images

To obtain the best print quality when printing images, use HP High Gloss Laser Paper (Q2419A). In either the software program or the driver, select **GLOSSY**, **HEAVY**, or **HIGH GLOSS** (HP Color LaserJet 4650 models only) or print from a tray that is configured for glossy paper.

- In either the software program or the printer driver, select **HIGH GLOSS IMAGES** (HP Color LaserJet 4650 models only) as the media type, or print from a tray that is configured for glossy paper.
- You can also configure the printer by using settings on the printer control panel.

Envelopes

NOTE Envelopes can be printed on only from tray 1. Set the tray media size to the specific envelope size.

Adhering to the following guidelines will help ensure high-quality printing on envelopes and help prevent printer jams:

- Do not load more than 20 envelopes into tray 1.
- The weight-rating of envelopes should not exceed 105 g/m^2 (28-lb bond).
- Envelopes should be flat.

- Do not use envelopes that contain windows or clasps.
- Envelopes must not be wrinkled, nicked, or otherwise damaged.
- Envelopes that include peel-off adhesive strips must use adhesives that can withstand the heat and pressures of the printer's fusing process.
- Envelopes should be loaded face-down, with the postage-end feeding into the printer first.

Labels

NOTE To print on labels, set the tray media type to **LABELS** on the printer control panel. When printing on labels, use the following guidelines:

- Verify that the adhesive material on the labels can tolerate 190°C (374°F) for 0.1 second.
- Verify that no adhesive material is exposed between the labels. Exposed areas can cause labels to peel off during printing, which can cause printer jams. Exposed adhesive can also cause damage to printer components.
- Do not refeed a sheet of labels.
- Verify that the labels lie flat.
- Do not use labels that are wrinkled, bubbled, or otherwise damaged.

Heavy paper

The following heavy paper types can be used with the HP Color LaserJet 4610n and 4650 models.

Paper type	Paper weight
Heavy	105- to 120-g/m^2
	28- to 32-lb
Extra heavy	120- to 163-g/m^2
	32- to 43-lb
Cardstock	163- to 199-g/m^2
	43-to 53–lb
Intermediate	90- to105-g/m^2
	24- to 28-lb
Tough paper	5 mil
	44- lb

When printing on heavy paper types, use the following guidelines:

- Use tray 1 for paper that is heavier than 120 to 199 g/m^2 (32- to 53-lb bond).
- For optimum results when printing on heavy paper, use the printer control panel to set the media type for the tray to **HEAVY**.
- In either the software program or the driver, select **HEAVY** as the media type, or print from a tray that is configured for heavy paper.
- Because this setting affects all print jobs, return the printer to its original settings after the job has printed.

CAUTION In general do not use paper that is heavier than the media specification recommended for this printer. Doing so can cause misfeeds, paper jams, reduced print quality, and excessive mechanical wear.

HP LaserJet Tough paper

When printing on HP LaserJet Tough paper, use the following guidelines:

- Handle HP LaserJet Tough paper by the edges. Oils from your fingers that are deposited on HP LaserJet Tough paper can cause print-quality problems.
- Use only HP LaserJet Tough paper with this printer. HP products are designed to work together for optimum printing results.
- In either the software program or the driver, select **TOUGH PAPER** as the media type, or print from a tray that is configured for HP LaserJet Tough paper.

Preprinted forms and letterhead

Observe the following guidelines for best results with preprinted forms and letterhead:

- Forms and letterhead must be printed with heat-resistant inks that will not melt, vaporize, or release hazardous emissions when subjected to the printer's fusing temperature of approximately 190°C (374°F) heat for 0.1 second.
- Inks must be non-flammable and should not adversely affect any printer rollers.
- Forms and letterhead should be sealed in a moisture-proof wrapping to prevent changes during storage.
- Before loading preprinted paper such as forms and letterhead, verify that the ink on the paper is dry. During the fusing process, wet ink can come off of preprinted paper.
- When using the duplex printing setting (HP CLJ 4600 and 4650 models only), load pre-printed forms and letterhead into tray 2 and tray 3 with the front of the page facing down and the top edge of the page towards the back of the printer. To load preprinted forms and letterhead into tray 1, load them with the front of the page facing up and the bottom edge feeding into the printer first.

Recycled paper

This printer supports the use of recycled paper. Recycled paper must meet the same specifications as standard paper. See the *HP LaserJet Printer Family Print Media Guide*. The Hewlett-Packard Company recommends that recycled paper contain no more than 5% ground wood.

Weight equivalence table

The weight equivalence table shows equivalent weights for different grades of paper. A boldface type value indicates a commonly available standard weight for that grade.

NOTE Text and book grades marked with an asterisk (*) actually calculate to 51, 61, 71, and 81 but are rounded to standard book or text weights of 50, 60, 70, and 80.

Table 1-11 Weight equivalence table

Bond weight (17 x 22 in)	Text/Book weight (25 x 38 in)	Cover weight (20 x 26 in)	Bristol weight (22.5 x 28.5 in)	Index weight (25.5 x 30.5 in)	Tag weight (24 x 36 in)	Metric weight
16	41	22	27	33	37	**60 g/m^2**
17	43	24	29	35	39	**64 g/m^2**
20	50*	28	34	42	46	**75 g/m^2**
21	54	30	36	44	49	**80 g/m^2**
24	**60***	33	41	50	55	**90 g/m^2**
27	68	37	45	55	61	**100 g/m^2**
28	**70***	39	49	58	65	105 g/m^2
29	74	41	50	61	68	**110 g/m^2**
32	**80***	44	55	67	74	**120 g/m^2**
36	90	**50**	62	75	83	**135 g/m^2**
39	**100**	55	**67**	82	91	148 g/m2
40	101	55	68	83	92	**150 g/m^2**
43	110	**60**	74	**90**	**100**	163 g/m2
45	115	63	77	94	104	**170 g/m^2**
47	119	**65**	80	97	108	176 g/m2
51	128	70	86	105	117	**190 g/m^2**
53	134	74	90	**110**	122	199 g/m^2
54	137	75	93	113	**125**	203 g/m^2
58	146	**80**	98	120	133	216 g/m^2
65	165	**90**	111	135	**150**	244 g/m^2
66	169	92	114	138	154	**250 g/m^2**
67	171	94	115	**140**	155	253 g/m^2
70	178	98	**120**	146	162	264 g/m^2
72	183	**100**	123	150	166	271 g/m^2

Environmental product stewardship program

Protecting the environment

Hewlett-Packard Company is committed to providing quality products in an environmentally sound manner. This product has been designed with several attributes to minimize impacts on the environment.

Ozone production

This product generates no appreciable ozone gas (O_3).

Power consumption

Power usage drops significantly while in PowerSave mode, which saves natural resources and saves money without affecting the high performance of this printer. As an ENERGY STAR® partner, Hewlett-Parkard has determined this product meets the ENERGY STAR® for energy efficiency.

ENERGY STAR® is a U.S. registered service mark of the U.S. Environmental Protection Agency. As an ENERGY STAR® partner, Hewlett-Packard Company has determined that this product meets ENERGY STAR® Guidelines for energy efficiency. For more information, see www.energystar.gov.

Paper use

This product's optional, automatic, duplex feature (two-sided printing, and N-up printing (multiple pages printed on one page) capability can reduce paper usage and the resulting demands on natural resources.

Plastics

Plastic parts over 25 grams have markings according to international standards that enhance the ability to identify plastics for recycling purposes at the end of the product's life.

HP LaserJet printing supplies

In many countries/regions, this product's printing supplies (print cartridges, fuser, and transfer unit) can be returned to HP through the HP Printing Supplies Returns and Recycling Program. An easy-to-use and free take back program is available in over 48 countries/regions. Multilingual program information and instructions are included in every new HP LaserJet print cartridge and supplies package.

HP Printing Supplies Returns and Recycling Program Information

Since 1990, the HP Printing Supplies Returns and Recycling Program has collected millions of used LaserJet print cartridges that otherwise might have been discarded in the world's landfills. The HP LaserJet print cartridges and supplies are collected and bulk-shipped to our resource and recovery partners, who disassemble the cartridges. After a thorough quality inspection, selected parts are

reclaimed for use in new cartridges. Remaining materials are separated and converted into raw materials for use by other industries to make a variety of useful products.

- **U.S. returns**—For a more environmentally responsible return of used cartridges and supplies, HP encourages the use of bulk returns. Simply bundle two or more cartridges together and use the single, pre-paid, and pre-addressed UPS label that is supplied in the package. For more information in the U.S., call 800-340-2445 or visit the HP LaserJet Supplies Web site at www.hp.com/go/recycle.
- **Non-U.S. recycling returns**—Non-U.S. customers should call the local HP Sales and Service Office or visit the www.hp.com/go/recycle Web site for further information regarding availability of the HP Supplies Returns and Recycling Program.

Recycled paper

This product can use recycled papers when the paper meets the guidelines outlined in the *HP LaserJet Family Print Media Guide*. This product is suitable for the use of recycled paper according to EN 12281:2002.

Material restrictions

This product does not contain batteries.

This product does not contain added mercury.

This product contains lead in solder that might require special handling at end-of-life.

For recycling information, contact www.hp.com/go/recycle, contact your local authorities, or go to the Electronics Industries Alliance Web site www.eiae.org.

For more information

.

Go to www.hp.com/go/environment or www.hp.com/hpinfo/community/environment for more information about HP's environmental programs, including information about the following topics:

- Product environmental profile sheet for this and many related HP products
- HP's commitment to the environment
- HP's environmental management system
- HP's end-of-life product return and recycling program
- Material Safety Data Sheets (MSDS)

Hewlett-Packard limited warranty statement

HP product	Duration of Limited Warranty
HP Color LaserJet 4600/4650, 4600n/4610n/4650n, 4600dn/4650dn, 4600dtn/4650dtn, and 4600hdn/4650hdn printer	One-year limited warranty

HP warrants HP hardware, accessories, and supplies against defects in materials and workmanship for the period specified above. If HP receives notice of such defects during the warranty period, HP will, at its option, either repair or replace products which prove to be defective. Replacement products may be either new or like-new.

HP warrants that HP software will not fail to execute its programming instructions, for the period specified above, due to defects in material and workmanship when properly installed and used. If HP receives notice of such defects during the warranty period, HP will replace software media which does not execute its programming instructions due to such defects.

HP does not warrant that the operation of HP products will be uninterrupted or error free. If HP is unable, within a reasonable time, to repair or replace any product to a condition as warranted, customer will be entitled to a refund of the purchase price upon prompt return of the product.

HP products may contain remanufactured parts equivalent to new in performance or may have been subject to incidental use.

Warranty does not apply to defects resulting from (a) improper or inadequate maintenance or calibration, (b) software, interfacing, parts or supplies not supplied by HP, (c) unauthorized modification or misuse, (d) operation outside of the published environmental specifications for the product, or (e) improper site preparation or maintenance.

TO THE EXTENT ALLOWED BY LOCAL LAW, THE ABOVE WARRANTIES ARE EXCLUSIVE AND NO OTHER WARRANTY, WHETHER WRITTEN OR ORAL, IS EXPRESSED OR IMPLIED AND HP SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY, SATISFACTORY QUALITY, AND FITNESS FOR A PARTICULAR PURPOSE.

TO THE EXTENT ALLOWED BY LOCAL LAW, THE REMEDIES IN THIS WARRANTY STATEMENT ARE THE CUSTOMER'S SOLE AND EXCLUSIVE REMEDIES. EXCEPT AS INDICATED ABOVE, IN NO EVENT WILL HP OR ITS SUPPLIERS BE LIABLE FOR LOSS OF DATA OR FOR DIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL (INCLUDING LOST PROFIT OR DATA), OR OTHER DAMAGE, WHETHER BASED IN CONTRACT, TORT, OR OTHERWISE.

FOR CONSUMER TRANSACTIONS IN AUSTRALIA AND NEW ZEALAND; THE WARRANTY TERMS CONTAINED IN THIS STATEMENT, EXCEPT TO THE EXTENT LAWFULLY PERMITTED, DO NOT EXCLUDE, RESTRICT OR MODIFY AND ARE IN ADDITION TO THE MANDATORY STATUTORY RIGHTS APPLICABLE TO THE SALE OF THIS PRODUCT TO YOU.

The warranty period begins on the date of the delivery or on the date of installation if installed by HP. If customer schedules or delays HP installation more than 30 days after delivery, warranty begins on the 31st day from delivery.

Declaration of conformity

Declaration of conformity

according to ISO/IEC Guide 22 and EN 45014

Manufacturer's Name:	Hewlett-Packard Development Company
Manufacturer's Address:	11311 Chinden Boulevard, Boise, Idaho 83714-1021, USA
declares that the product	
Product Name:	HP Color LaserJet 4600/4600n/4600dn/4600dtn/4600hdn printers[1] HP Color LaserJet 4610n printer[1] HP Color LaserJet 4650/4650n/4650dn/4650dtn/4650hdn printers[1]
Regulatory Model Number:[4]	BOISB-0304-00
Model Number:	C9660A, C9692A, C9661A, C9662A, C9663A Q7732A Q3668A, Q3669A, Q3670A, Q3671A, Q3672A Including C9664A 500-sheet paper feeder Q3673A - Optional 500-Sheet Input Tray Q3674A - Optional 2 x 500-Sheet Input Tray
Product Options:	All
conforms to the following Product Specifications:	
Safety:	IEC 60950:1999 / EN60950:2000 IEC 60825-1:1993 +A1:1997 +A2:2001 / EN60825-1:1994 +A11:1996 +A2:2001 (Class 1 Laser/LED Product) GB4943-2001
EMC:	CISPR 22:1997 / EN 55022:1998 Class B[1, 3] EN 61000-3-2:1995 / A14 EN 61000-3-3:1995 / A1 EN 55024:1998 FCC Title 47 CFR, Part 15 Class B[1] / ICES-003, Issue 3 GB9254-1998, GB17625.1-1998

Supplementary Information:

The product herewith complies with the requirements of the EMC Directive 89/336/EEC and the Low Voltage Directive 73/23/EEC, and carries the CE-Marking accordingly:

[1]This Device complies with Part 15 of the FCC Rules. Operation is subject to the following two Conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

[2]The product was tested in a typical configuration with Hewlett-Packard Personal Computer Systems.

[3]The product includes LAN (Local Area Network) options. When the interface cable is attached to LAN connectors, the product meets the requirements of EN55022 Class A in which case the following applies: "Warning - This is a class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures".

[4]For regulatory purposes, this product is assigned a Regulatory model number. This number should not be confused with the product name or the product number(s).

Boise, Idaho 83714-1021, USA

Declaration of conformity

29 January, 2004

For regulatory topics only:

Australia Contact:	Product Regulations Manager, Hewlett-Packard Australia, Ltd., 31-41 Joseph Street, Blackburn, Victoria 3130, Australia,
European Contact:	Your Local Hewlett-Packard Sales and Service Office or Hewlett-Packard Gmbh, Department HQ-TRE/Standards Europe, Herrenberger Straße 140, Böblingen, D-71034, Böblingen, (FAX: +49-7031-14-3143),
USA Contact:	Product Relations Manager, Hewlett-Packard Company, PO Box 15, Mail Stop 160,Boise, Idaho 83707-0015, USA, (Phone: 208-396-6000),

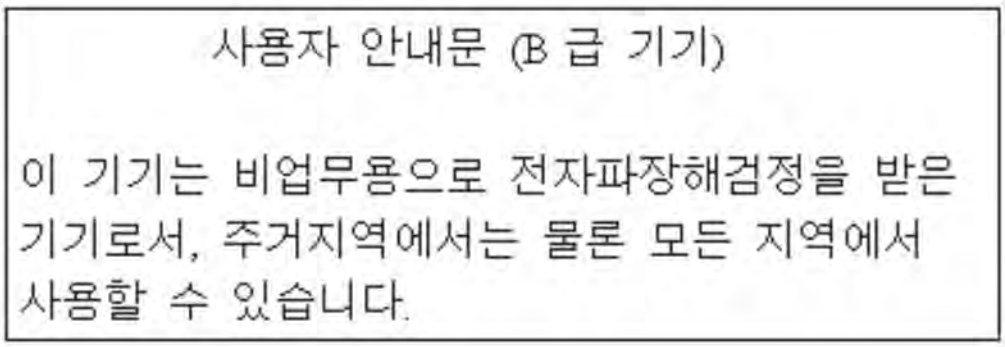
Country/region laser safety statements

Canadian DOC regulations

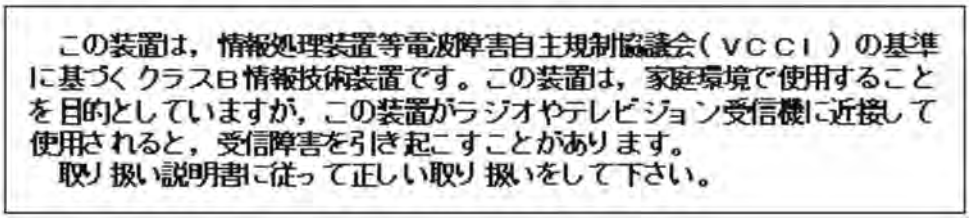
Complies with Canadian EMC Class B requirements.

« Conforme à la classe B des normes canadiennes de compatibilité électromagnétiques. «CEM».»

EMI statement (Korea)



VCCI statement (Japan)



Laser Statement for Finland

Luokan 1 laserlaite

Klass 1 Laser Apparat

HP Color LaserJet 4600/4650, 4600/4610n/4650n, 4600/4650dn, 4650dtn, 4650hdn laserkirjoitin on käyttäjän kannalta turvallinen luokan 1 laserlaite. Normaalissa käytössä kirjoittimen suojakotelointi estää lasersäteen pääsyn laitteen ulkopuolelle. Laitteen turvallisuusluokka on määritetty standardin EN 60825-1 (1994) mukaisesti.

VAROITUS!

Laitteen käyttäminen muulla kuin käyttöohjeessa mainitulla tavalla saattaa altistaa käyttäjän turvallisuusluokan 1 ylittävälle näkymättömälle lasersäteilylle.

VARNING!

Om apparaten används på annat sätt än i bruksanvisning specificerats, kan användaren utsättas för osynlig laserstrålning, som överskrider gränsen för laserklass 1.

HUOLTO

HP Color LaserJet 4650, 4650n, 4650dn, 4650dtn, 4650hdn -kirjoittimen sisällä ei ole käyttäjän huollettavissa olevia kohteita. Laitteen saa avata ja huoltaa ainoastaan sen huoltamiseen koulutettu henkilö. Tällaiseksi huoltotoimenpiteeksi ei katsota väriainekasetin vaihtamista, paperiradan puhdistusta tai muita käyttäjän käsikirjassa lueteltuja, käyttäjän tehtäväksi tarkoitettuja ylläpitotoimia, jotka voidaan suorittaa ilman erikoistyökaluja.

VARO!

Mikäli kirjoittimen suojakotelo avataan, olet alttiina näkymättömällelasersäteilylle laitteen ollessa toiminnassa. Älä katso säteeseen.

VARNING!

Om laserprinterns skyddshölje öppnas då apparaten är i funktion, utsättas användaren för osynlig laserstrålning. Betrakta ej strålen. Tiedot laitteessa käytettävän laserdiodin säteilyominaisuuksista: Aallonpituus 775-795 nm

Teho 5 m W

Luokan 3B laser

Japan power-cord statement

製品には、同梱された電源コードをお使い下さい。
同梱された電源コードは、他の製品では使用出来ません。

2 Service approach

This chapter provides information about the following topics:

- Service approach
- Parts and supplies
- HP customer care
- Ordering related documentation and software

Service approach

Printer repair normally begins by using the printer's internal diagnostics and the following three-step process.

1. Isolate the problem to the major system (for example, the host computer, the network or server, or the printer system).
2. Determine if the problem is located in the accessories or in the printer engine.
3. Troubleshoot the problem by using the procedures in chapter 7.

After you locate a faulty part, the printer can usually be repaired at the assembly level by replacing field replaceable units (FRUs). Some mechanical assemblies might need to be repaired at the subassembly level. Hewlett-Packard does not support replacement of components on the printer circuit assembles.

Parts and supplies

Field replaceable and accessory part numbers are contained in chapter 8 of this manual. Order replacement parts from Hewlett-Packard Customer Support-Americas (HPCS-A) or Hewlett-Packard Customer Support-Europe (HPCS-E).

CAUTION Use only accessories specifically designed for this printer. Accessories can be ordered from an authorized service or support provider.

Ordering parts, supplies, and accessories over the Internet

To order supplies in the US, contact www.hp.com/go/ljsupplies. To order supplies worldwide, see www.hp.com/ghp/buyonline.html. To order accessories, see www.hp.com.

Ordering directly through the embedded Web server (for printers with network connections)

NOTE This section applies to the HP Color LaserJet 4600 and 4650 models only.

Use the following steps to order printing supplies directly through the embedded Web server.

1. In the Web browser on the computer, type the IP address for the printer. The printer status window appears. Or, go to the URL provided in the alert email.
2. Click **Other Links**.
3. Click **Order Supplies**. The browser opens to a page in which you can choose to send information about the printer to HP. You also have the option to order supplies without sending the printer information to HP.
4. Select the part numbers you want to order and follow the instructions on the screen.

Ordering directly through the HP Toolbox software (HP CLJ 4650 only)

The HP Toolbox software gives you the ability to order supplies directly from the computer. Two things are necessary to use this feature:

- The HP Toolbox software must be installed on your computer. (It is automatically installed as part of the typical software installation.)
- You must have access to the World Wide Web.

1. At the bottom right of the screen (in the system tray), click the **hp Toolbox** icon. The software opens in a Web browser. (Or, on the **Start** menu, select **Programs**, and then select **HP CLJ 4650 HP Toolbox**.)
2. On the left side of the window, click **Other Links**.
3. Click **Order Supplies**. The browser opens to the supplies purchasing page.
4. Select the supplies you want to order.

Exchange program

HP offers remanufactured assemblies for some parts. These are identified in chapter 8 and can be ordered from Hewlett-Packard Customer Support-Americas (HPCS-A) or Hewlett-Packard Customer Support-Europe (HPCS-E).

Supplies

Paper and print cartridges can be ordered directly from Hewlett-Packard. See chapter 8 for ordering information.

World Wide Web

In the U.S., obtain printer drivers, updated HP printer software, and product and support information from one of the following URLs:

- www.hp.com/support/clj4600
- www.hp.com/support/clj4610
- www.hp.com/support/clj4650

Printer drivers can be obtained from the following sites:

Table 2-1 Web sites for downloading printer drivers

In China	ftp://www.hp.com.cn/support/clj4600
	ftp://www.hp.com.cn/support/clj4610
	ftp://www.hp.com.cn/support/clj4650
In Japan	ftp://www.jpn.hp.com/support/clj4600
	ftp://www.jpn.hp.com/support/clj4610
	ftp://www.jpn.hp.com/support/clj4650
In Korea	www.hp.co.kr/support/clj4600
	www.hp.co.kr/support/clj4610
	www.hp.co.kr/support/clj4650
In Taiwan	www.hp.com.tw/support/clj4600
	www.hp.com.tw/support/clj4610
	www.hp.com.tw/support/clj4650
	or the local driver Web site: www.dds.com.tw

HP Service Parts Information

Parts identification and pricing information can also be found on the World Wide Web at www.hp.com/go/hpparts.

HP customer care

Online services

For 24-hour access to information using a modem or Internet connection:

World Wide Web URL: for the HP Color LaserJet 4600 Series printers, updated HP printer software, product and support information, and printer drivers in several languages can be obtained from www.hp.com/support/clj4600, www.hp.com/support/clj4610, or www.hp.com/support/clj4650. (Sites are in English.)

Visit www.hp.com/support/net_printing for information about the HP Jetdirect 4650 external print server.

HP Instant Support Professional Edition (ISPE) is a suite of Web-based troubleshooting tools for desktop computing and printing products. ISPE helps you quickly identify, diagnose, and resolve computing and printing problems. The ISPE tools are available at www.instantsupport.hp.com.

Telephone support

HP provides free telephone support during the warranty period. When you call, you will be connected to a responsive team waiting to help you. For the telephone number for your country/region, see the flyer that shipped in the box with the product, or visit www.hp.com/support/callcenters. Before calling HP, have the following information ready: product name and serial number, date of purchase, and description of the problem.

You can also find support on the Internet at www.hp.com. Click the **support & drivers** block.

Software utilities, drivers, and electronic information

Visit http://www.hp.com/go/clj4600_software, for the HP Color LaserJet 4600 model www.hp.com/go/clj4610_software for the HP Color LaserJet 4610n model, or www.hp.com/go/clj4650_software for the HP Color LaserJet 4650 models. The Web page for the drivers might be in English, but you can download the drivers themselves in several languages.

See the flyer that shipped in the box with the printer for phone-contact information.

HP service information

To locate HP-Authorized Dealers, call 800-243-9816 (U.S.) or 800-387-3867 (Canada). For service for your product, call the customer support number for your country/region. See the flyer that shipped in the box with the printer.

HP service agreements

Call 800-835-4747 (U.S.) or 800-268-1221 (Canada).

For extended Service call, 800-446-0522

HP Toolbox (HP Color LaserJet 4650 models only)

To check the printer status and settings and to view troubleshooting information and online documentation, use the HP Toolbox. You can view the HP Toolbox when the printer is directly connected to your computer or when it is connected to a network. A complete software installation is necessary in order to use the HP Toolbox.

HP support and information for Macintosh computers

Visit www.hp.com/go/macosx for Macintosh OS X support information and HP subscription service for driver updates.

Visit www.hp.com/go/mac-connect for products designed specifically for the Macintosh user.

Ordering related documentation and software

The following table lists part numbers for related documentation and software.

Description	Part Number
HP LaserJet Family Print Media Guide	5963-7863
HP Jetdirect Print Server Administrator's Guide	See the CDROM that came with the printer, or visit www.hp.com
PCL/PJL Technical Reference Package	5021-0330
HP Color LaserJet 4600 Series Getting Started Guide	C9660-90902
HP Color LaserJet 4650 Series Getting Started Guide	Q3668-90902
HP Color LaserJet 4600 Series Service Manual **NOTE** This service manual includes the HP Color LaserJet 4600, 4610n, and 4650 model printers.	Q7732-90901
HP Color LaserJet 4600 Series printer Service and Support CD-ROM	Q3668-60105
HP Color LaserJet 4610n printer User Guide For downloadable versions, go to www.hp.com/support/clj4610. When connected, select **manuals**.	Q7732–90902
HP Color LaserJet 4650 User Guide For downloadable versions, go to www.hp.com/support/clj4650. When connected, select **manuals**.	Q3668-90909

3 Installation and configuration

This chapter contains information about the following topics:

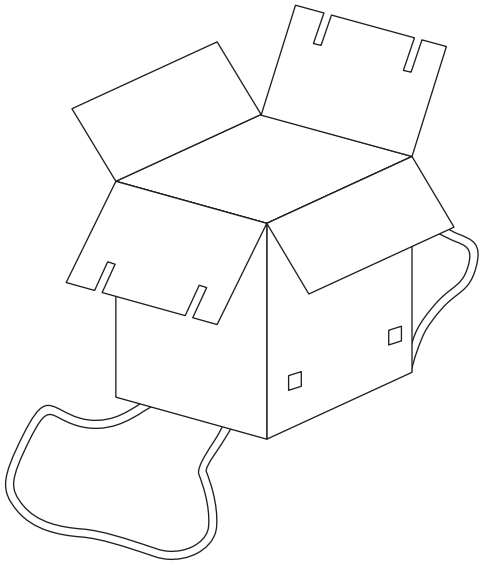
- Unpacking the printer
- Installing the media tray
- Connecting power
- Installing the print cartridges
- Installing a new overlay (HP Color LaserJet 4600 models)
- Installing a new control-panel label (HP Color LaserJet 4650 models)
- Testing the printer operation
- Using PowerSave
- Connecting to a computer
- Printer drivers
- Software for Macintosh computers
- Installing the printing system software
- Network configuration
- Software for networks
- HP Web Jetadmin
- UNIX
- Utilities
- Embedded Web server (HP Color LaserJet 4600 and 4650 models only)
- Setting network security on the printer

Unpacking the printer

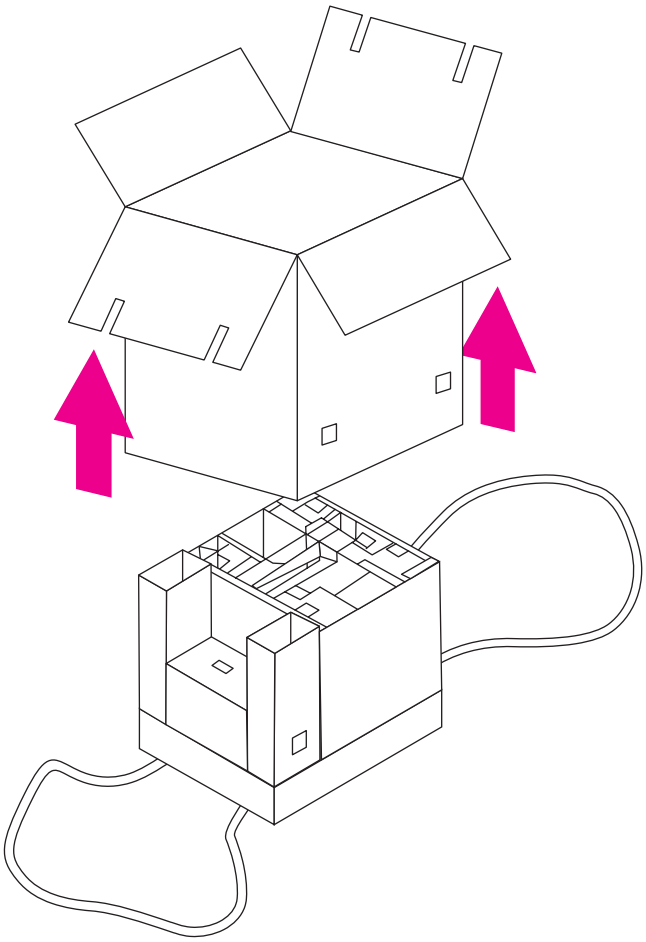
NOTE Save all the packing materials in case you need to repack and transport the printer at a later date.

WARNING! The HP Color LaserJet 4600/4610/4650 Series printer weighs approximately 36 kg (80 lb). HP recommends having two or more people lift or move the printer.

1 Do not cut the straps. Open the top flaps of the packing box. Detach the straps from the top flaps and lay them on the floor.

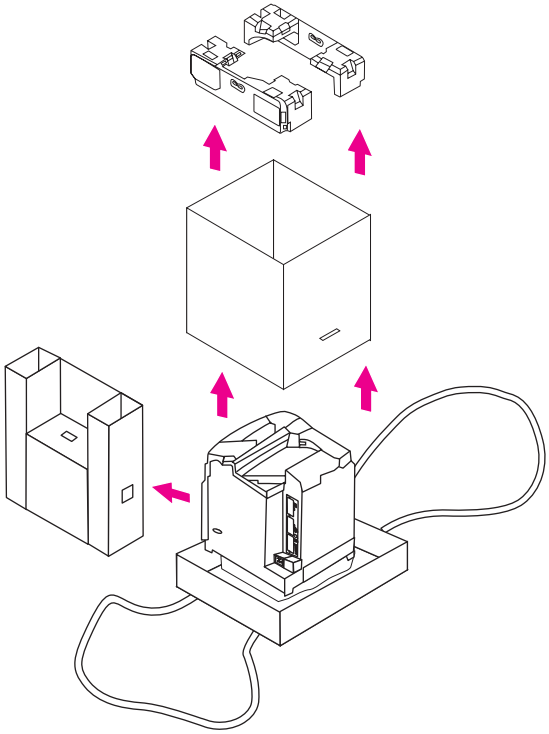


2 Lift the box frame up and off of the printer.



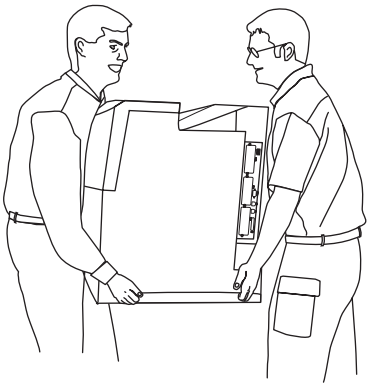
3 **HP CLJ 4600 and 4650 models only**: If the printer has an optional 500-sheet paper feeder, it is packaged on top of the printer. Lift the 500-sheet paper feeder from the package, and place it in the prepared location.

4 Remove the shipping blocks, accessory packs, and inner cardboard frame that surround the printer.



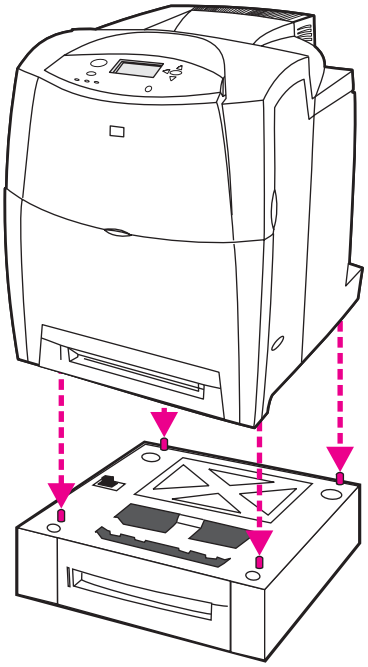
5 Lift the printer from the packaging pallet and place it in the prepared location.

CAUTION Do not attempt to lift the printer by yourself. At least two people must lift the printer and place it in the prepared location. While two people can lift the printer, using three or four people to lift the printer is a much easier and safer way to move the printer.

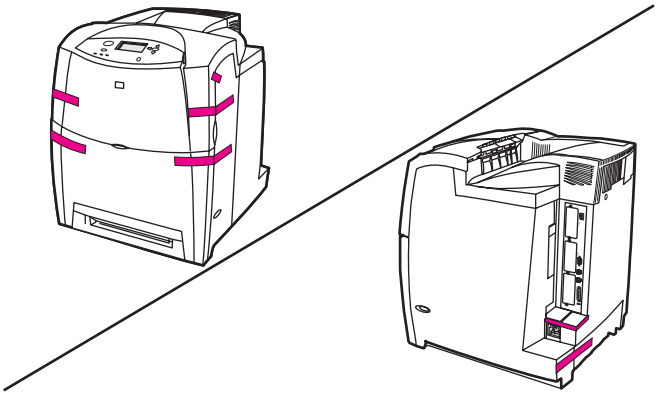


6 If you are using an optional 500-sheet paper feeder (HP CLJ 4600 and 4650 models only) or a 2 x 500-sheet feeder (HP CLJ 4650 models only), align the printer with the guide pins on top of the paper feeder (the optional 500-sheet paper feeder is shown in the following illustration).

NOTE While two people can lift the printer, at least one other person should be available to help position the printer on an optional paper feeder if one is installed.

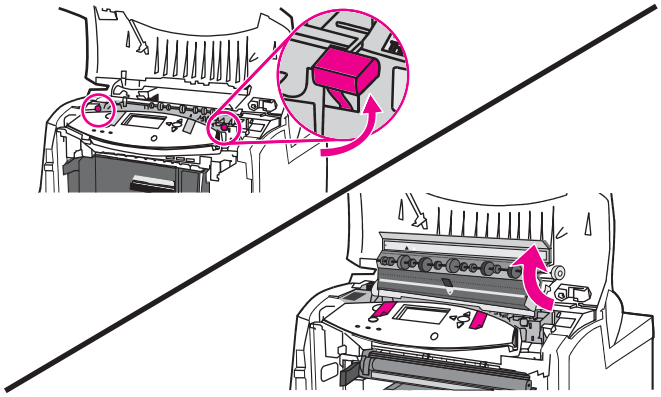


7 Remove the packing tape from the front and rear of the printer.

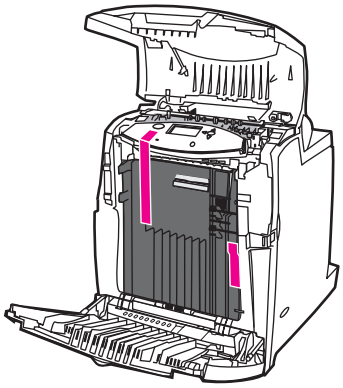


8 Using the side handles, open the top cover. Firmly lift the two green handles (one on each side of the fuser). Lift the fuser cover completely, and pull on either of the orange tabs to remove the orange fuser packing tape and plastic shipping locks. Close the fuser cover.

CAUTION Make sure that you remove all of the packing materials to avoid damage to the printer when the power is turned on.



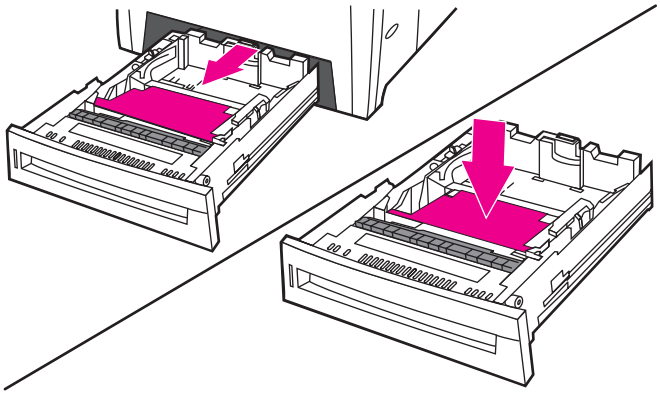
9 Open the front cover and remove the packing tape from the transfer unit. Close the front cover and the top cover.



Installing the media tray

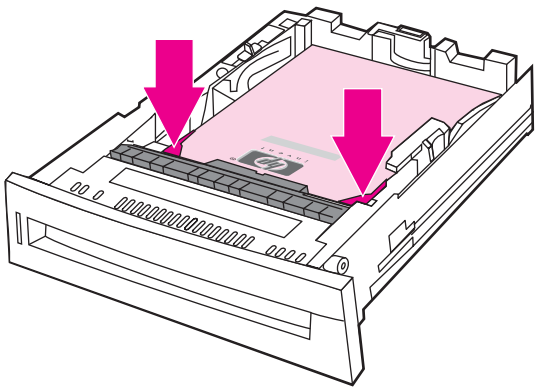
1 Remove the tray from the printer. Push the media lift plate down until it locks. Remove the cardboard from the tray.

> **CAUTION** You must push the media lift plate down until it locks every time you open the tray. Jams will result if the media lift plate is not locked in the down position.

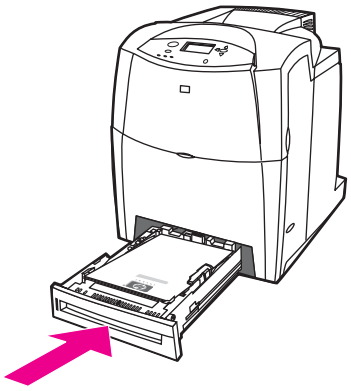


2 Adjust the rear length guide by squeezing the guide adjustment latch and sliding the back of the tray to the length of the media being loaded. Slide the width guides to the appropriate size.

3 Load media face-up. Make sure that the front corners of the media fit under the front corner tabs.

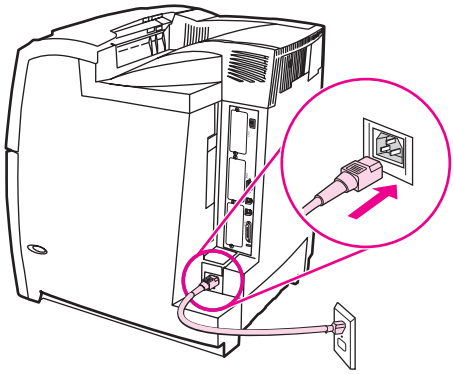


4 Slide the media input tray straight into the slot at the bottom of the printer.



Connecting power

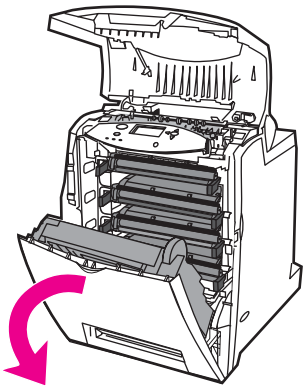
1 Plug the ac power cord into the printer and into the power outlet.



2 Turn the printer on.

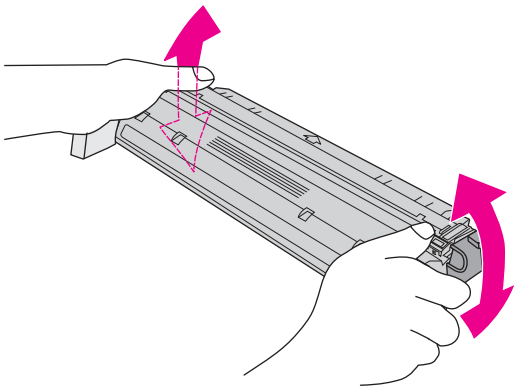
Installing the print cartridges

1 Open the top cover. Grasp the green handle on the transfer unit and pull down. The front cover will open as you pull down the transfer unit.

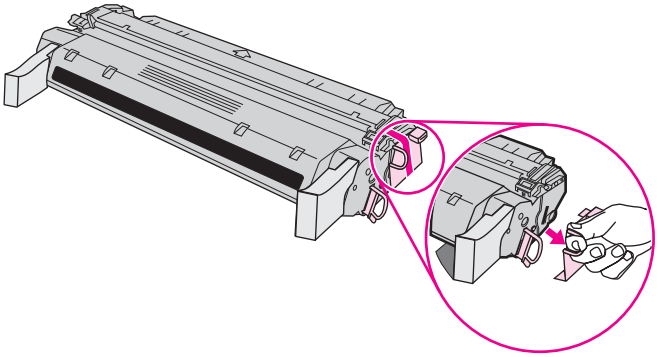


CAUTION Do not place anything on the transfer unit while it is open. If the transfer unit is punctured, print quality problems can result.

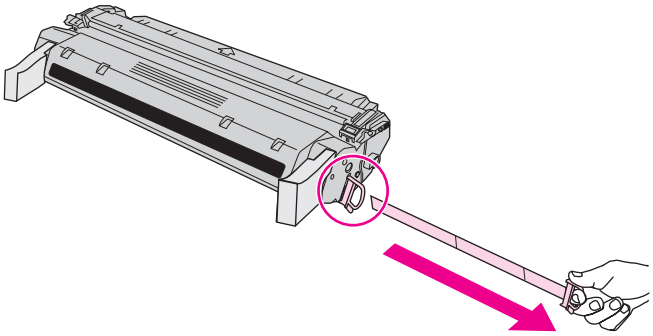
2 Grasp both sides of the cartridge and distribute the toner by gently rocking the cartridge from side to side.



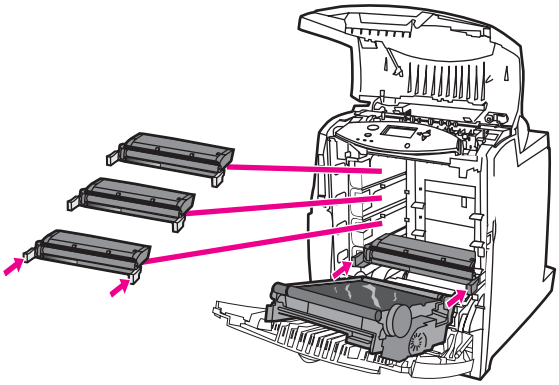
3 Remove the tape from the orange shipping lock. Remove and discard the orange shipping lock.



4 Remove the inside sealing tape by pulling the orange loop on the end and pulling the tape completely out. Discard the tape.



5 Grasp the blue handles on the sides of the print cartridge. Insert the print cartridges, starting with the bottom cartridge, in the correct position (C = cyan, Y = yellow, M = magenta, K = black).



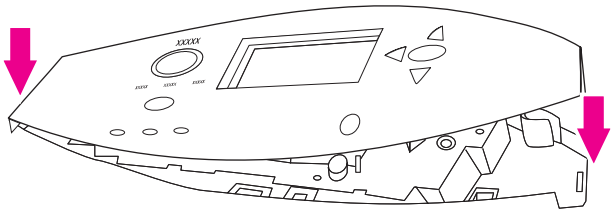
6 Close the transfer unit and front cover. Close the top cover. After a short while, the **Ready** message should appear on the control-panel display.

Installing a new overlay (HP Color LaserJet 4600 models)

NOTE The HP Color LaserJet 4610n printer control panel is available in English only. You do not need to install an overlay or a label for this model. For HP CLJ 4650 models, see Installing a new control-panel label (HP Color LaserJet 4650 models).

Some printer models are shipped without the control-panel overlay installed, or you might prefer using a different overlay from the one that is installed. Overlays are available for several languages, and you can change the languages for control-panel messages. If you are setting up a printer for a language other than English, follow this procedure.

1. Open the top cover. Use a small flat-blade screwdriver to release the locking tabs on either side of the control-panel overlay, and then remove the overlay.
2. Position the new overlay over the top of the control panel. Insert the left tab of the overlay into the slot on the printer face. Line up the tab on the right side of the overlay with the slot on the right side of the control panel. Set the overlay in place by pushing down on the overlay near the blue button.



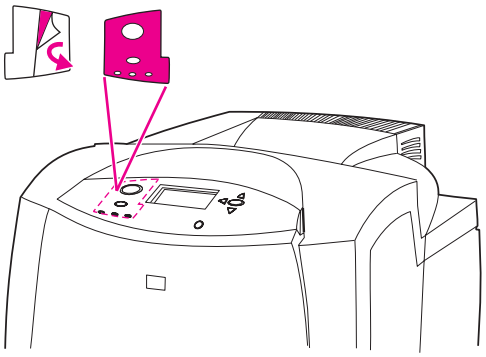
3. Press ✓ to open the **MENUS**.
4. Press ▼ to highlight **CONFIGURE DEVICE**.
5. Press ✓ to select **CONFIGURE DEVICE**.
6. Press ▼ to highlight **SYSTEM SETUP**.
7. Press ✓ to select **SYSTEM SETUP**.
8. Press ▼ to highlight **LANGUAGE**.
9. Press ✓ to select **LANGUAGE**.
10. Press ▼ to highlight the appropriate language, and then press ✓ to select and save the language choice.

Installing a new control-panel label (HP Color LaserJet 4650 models)

NOTE The HP Color LaserJet 4610n printer control panel is available in English only. You do not need to install an overlay or a label for this model. For HP CLJ 4600 models, see Installing a new overlay (HP Color LaserJet 4600 models).

Some printer models are shipped without the control panel labels installed or you might prefer using a different label from the one that is installed. Labels are available for several languages, and you can change the language for control-panel messages. If you are setting up a printer for a language other than English, follow this procedure.

1. Remove the backing from the adhesive side of the label.
2. Position the new label over the top of the control panel.
3. Press the label firmly down onto the control panel.



NOTE When applying the label, start at the center and press the label into place towards the edges of the control panel.

4. Press MENU to open the **MENUS**.
5. Press ▼ to highlight **CONFIGURE DEVICE**.
6. Press ✓ to select **CONFIGURE DEVICE**.
7. Press ▼ to highlight **SYSTEM SETUP**.
8. Press ✓ to select **SYSTEM SETUP**.
9. Press ▼ to highlight **LANGUAGE**.
10. Press ✓ to select **LANGUAGE**.
11. Press ▼ to highlight the appropriate language, and then press ✓ to select and save the language choice.

Testing the printer operation

Print a configuration page to ensure that the printer is working correctly.

1. Press ✓ (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models) to open the **MENUS**.
2. Press ▼ to highlight **INFORMATION**.
3. Press ✓ to select **INFORMATION**.
4. Press ▼ to highlight **PRINT CONFIGURATION**.
5. Press ✓ to select **PRINT CONFIGURATION**.

Using PowerSave

The adjustable PowerSave Time feature reduces power consumption when the printer has been inactive for an extended period. You can set the length of time before the printer goes into PowerSave mode (PowerSave settings vary depending on the model of printer that you have).

NOTE The printer control-panel display dims when the printer is in PowerSave mode. PowerSave mode does not affect printer warm-up time.

To set PowerSave Time

1. Press ✓ (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models) to open the **MENUS**.
2. Press ▼ to highlight **CONFIGURE DEVICE**.
3. Press ✓ to select **CONFIGURE DEVICE**.
4. Press ▼ to highlight **SYSTEM SETUP**.
5. Press ✓ to select **SYSTEM SETUP**.
6. Press ▼ to highlight **POWERSAVE TIME**.
7. Press ✓ to select **POWERSAVE TIME**.
8. Press ▲ or ▼ to select the appropriate time period.
9. Press ✓ to set the time period.
10. Press PAUSE/RESUME (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models).

To turn PowerSave on or off

1. Press ✓ (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models) to open the **MENUS**.
2. Press ▼ to highlight **CONFIGURE DEVICE**.
3. Press ✓ to select **CONFIGURE DEVICE**.
4. Press ▼ to highlight **RESETS**.
5. Press ✓ to select **RESETS**.
6. Press ▼ to highlight **POWERSAVE**.
7. Press ✓ to select **POWERSAVE**.
8. Press ▲ or ▼ to select **ON** or **OFF**.
9. Press ✓ to set the selection.
10. Press PAUSE/RESUME (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models).

Connecting to a computer

HP Color LaserJet 4600 and 4650 models support network and parallel connections at the same time.

NOTE Factory settings support automatic switching between the parallel port and one or more network connections on the printer (HP Color LaserJet 4600 and 4650 models only).

For the HP Color LaserJet 4610n printer, you can connect to a network by using an HP Jetdirect 175x external print server. Connect the print server to either the USB port or the parallel port. USB and parallel connections cannot be used at the same time.

Parallel connections

NOTE **HP Color LaserJet 4610n and 4650 models**: You cannot use the parallel connection and the USB connection at the same time.

To establish a parallel connection, connect the printer to the computer by using a bidirectional parallel cable (IEEE-1284-C). Plug that connector into the printer's parallel port. The cable can be a maximum of 10 meters (30 feet) long.

When used to describe a parallel interface, the term *bidirectional* indicates that the printer is able to both receive data from the computer and send data to the computer through the parallel port.

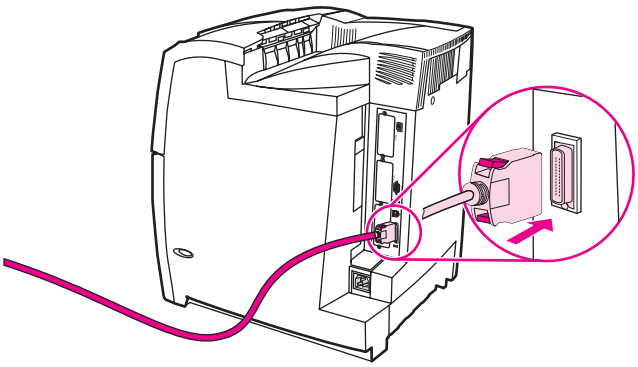


Figure 3-1 Parallel port connection (HP Color LaserJet 4600 models)

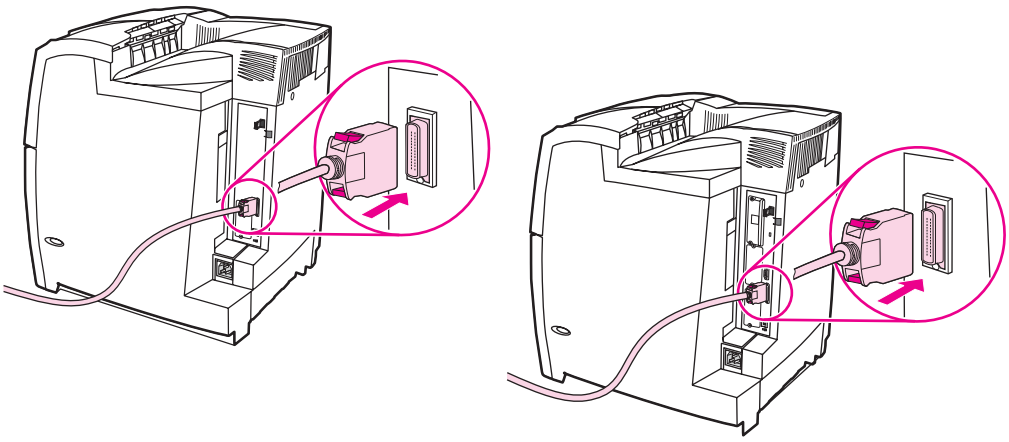


Figure 3-2 Parallel port connection (HP Color LaserJet 4610n and 4650 models)

NOTE To use the enhanced capabilities of the bidirectional parallel interface, ensure that the most recent printer driver is installed. These enhanced capabilities include bidirectional communication between the computer and printer, faster transfer of data, and automatic configuration of printer drivers.

USB configuration (HP Color LaserJet 4610n and 4650 models)

This printer supports a USB 1.1 connection. The port is located on the back of the printer, as shown in Figure 3-3 USB connection. You must use an A-to-B type USB cable.

NOTE USB support is not available for computers running Windows 95 or Windows NT 4.0. You cannot use the parallel connection and the USB connection at the same time.

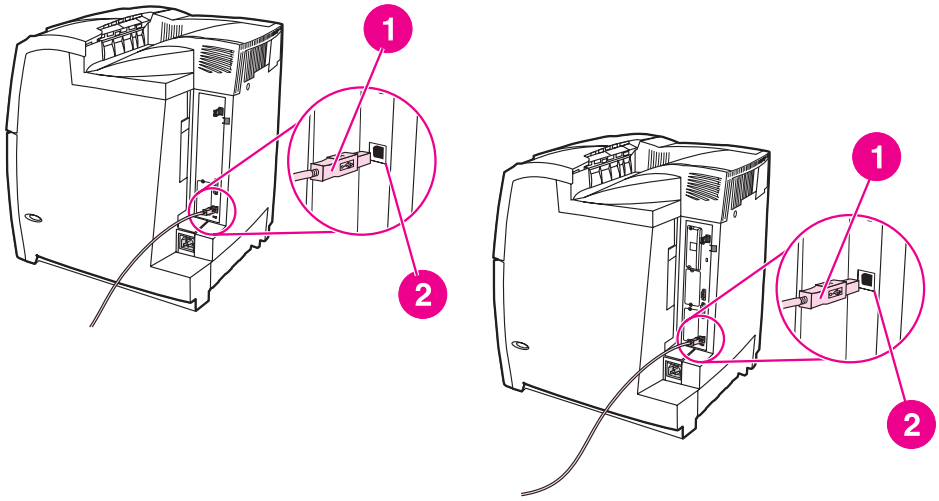


Figure 3-3 USB connection

1	USB connector
2	USB port

Auxiliary connection configuration (HP Color LaserJet 4650 models)

This printer supports an auxiliary connection for paper-handling input devices. The port is located on the back of the printer, as shown in the following figure.

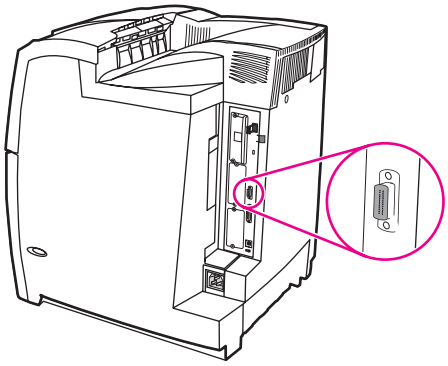


Figure 3-4 Auxiliary connection

Network connections

Use one of the following procedures to establish the appropriate connection to the network.

Direct to network (HP Color LaserJet 4600 and 4650 models)

Connect one end of the network cable to the RJ-45 port on the HP Jetdirect print server card. Connect the other end to the network.

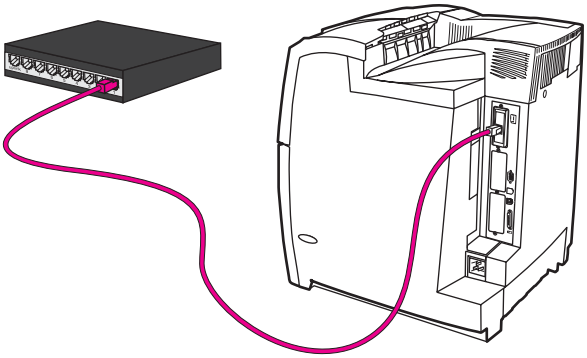


Figure 3-5 Direct to network connection

Network print server (HP Color LaserJet 4600 and 4650 models)

Connect one end of a network cable into the server. Connect the other end to the network. Connect one end of a second network cable to the printer and the other end to the network.

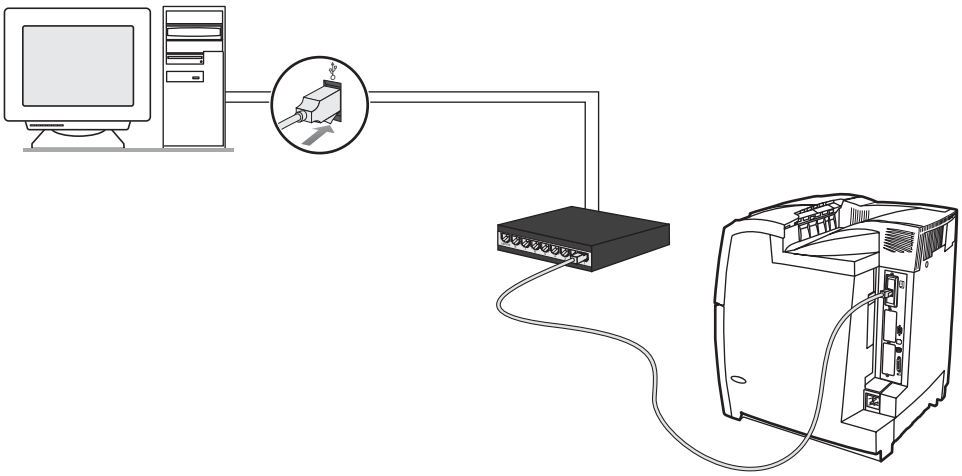
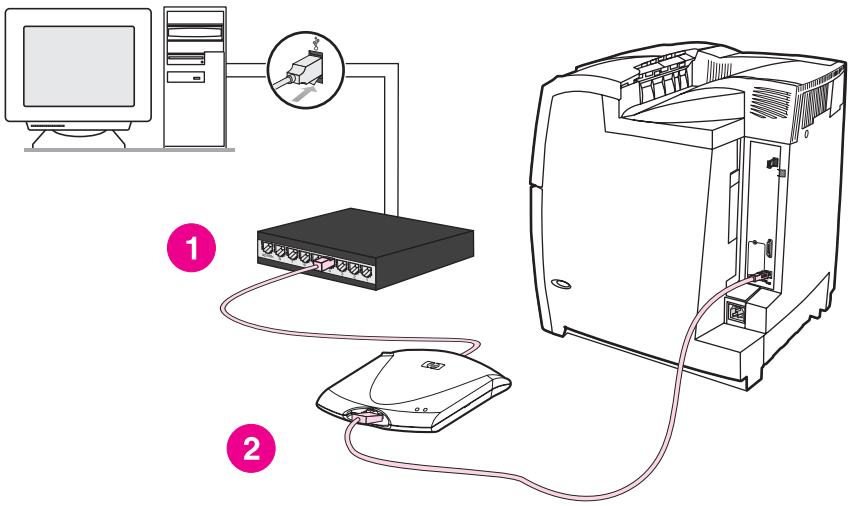


Figure 3-6 Network print server connection

Network print server (HP Color LaserJet 4610n printer)

Connect one end of a network cable to the server. Connect the other end to the network hub (callout 1). Connect one end of a second network cable to the HP Jetdirect 175x external print server (callout 2). Connect the other end to the network hub (callout 1). Connect one end of a USB cable to the HP Jetdirect 175x external print server (callout 2). Connect the other end of the USB cable to the printer.



Peer-to-peer (direct to network, HP Color LaserJet 4600 and 4650 models)

Connect one end of a network cable to the computer. Connect the other end to the network. Connect one end of a second network cable to the printer and the other end to the network.

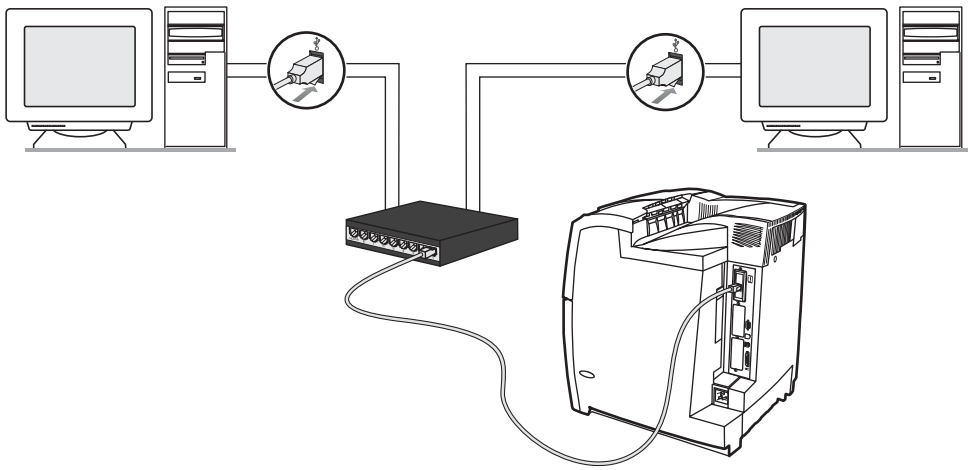


Figure 3-7 Peer-to-peer connection (direct to network)

Peer-to-peer (parallel)

Connect two or more computers to the network hub by using network cables. Connect one end of a parallel cable to the printer. Connect the other end to a computer.

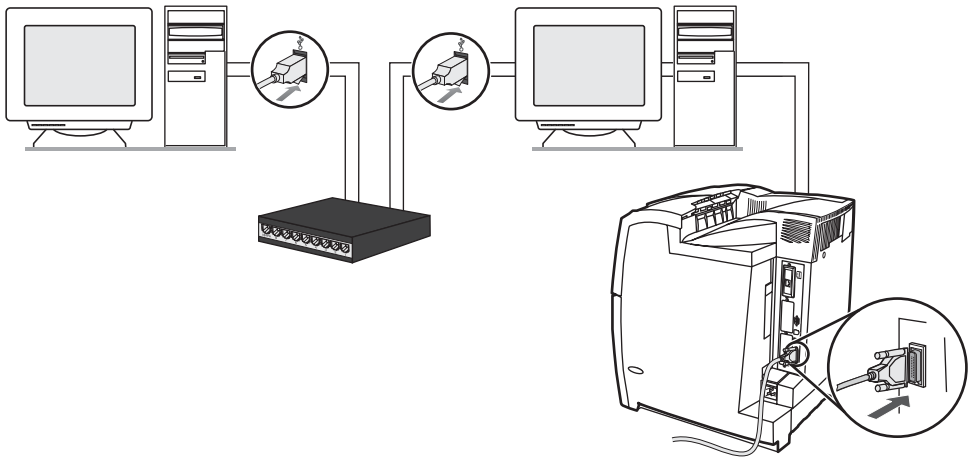


Figure 3-8 Peer-to-peer connection (parallel)

Enhanced I/O (EIO) configuration

The HP Color LaserJet 4600 and 4650 printer models come equipped with three enhanced input/output (EIO) slots. The three EIO slots hold compatible external devices such as the HP Jetdirect print server network cards or other devices. Plugging EIO network cards into the slots increases printer capabilities.

The EIO network cards can maximize printer performance when you are printing from a network. They also provide the ability to place the printer anywhere on a network. This eliminates the need to

attach the printer directly to a server or a workstation and allows you to place the printer closer to the network users.

If the printer is configured through an EIO network card, configure that card through the printer control-panel **Configure device** menu.

HP Jetdirect print servers

HP Jetdirect print servers (network cards) can be installed in one of the printer EIO slots on HP CLJ 4600 and 4650 models printers. The HP Color LaserJet 4610n printer can connect to a network by using the HP Jetdirect 175x external print server. These print servers support multiple network protocols and operating systems. HP Jetdirect print servers facilitate network management by allowing you to connect a printer directly to your network at any location. HP Jetdirect print servers also support the simple network management protocol (SNMP), which network managers can use for remote printer management and troubleshooting through HP Web Jetadmin software.

NOTE A network administrator should install these cards and configure the network. Configure the card either through the printer control panel or by using HP Web Jetadmin software.

NOTE See the HP Jetdirect print server documentation for information about which external devices or EIO network cards are supported.

Available enhanced I/O interfaces

HP Jetdirect print servers (network cards) provide software solutions for the following interfaces:

- Novell NetWare
- Microsoft® Windows® and Windows NT® networks
- Apple Mac OS (LocalTalk)
- UNIX® (HP-Ux and Solaris)
- Linux (Red Hat and SuSE)
- Internet printing

For a summary of available network software solutions, see the *HP Jetdirect Print Server Administrator's Guide*, or visit HP Customer Care online at www.hp.com/support/net_printing.

NetWare networks

When using Novell NetWare products with an HP Jetdirect print server, Queue Server mode provides better printing performance than does Remote Printer mode. The HP Jetdirect print server supports Novell Directory Services (NDS) as well as bindery modes. For more information, see the *HP Jetdirect Print Server Administrator's Guide*.

NOTE The HP Color LaserJet 4610n printer supports only Windows 2000 and Windows XP.

For Windows 95, 98, Millenium Edition (Me), NT 4.0, 2000, and XP systems, use the printer installation utility for printer setup on a NetWare network.

Windows and Windows NT networks

For Windows 95, 98, Me, NT 4.0, 2000, and XP systems, use your printer installation utility for printer setup on a Microsoft Windows network. The utility supports printer setup for either peer-to-peer or client-server network operation.

NOTE The HP Color LaserJet 4610n printer supports only Windows 2000 and Windows XP.

AppleTalk networks

Use the HP LaserJet Utility to set up the printer on an EtherTalk or LocalTalk network. For more information, see the *HP Jetdirect Print Server Administrator's Guide* that is included with printers equipped with the HP Jetdirect print server.

LocalTalk configuration

Use LocalTalk interface to print directly from a standalone Macintosh computer or from a Macintosh computer on a LocalTalk network. For specific information about configuring the computer and printer to print through a LocalTalk interface, see the printer getting started guide and the *HP Jetdirect Print Server Administrator's Guide*.

NOTE For LocalTalk configuration, the DIN-8 printer cable must be connected to the printer port on the Macintosh computer.

LocalTalk network configuration

To connect the printer to a Macintosh computer on a LocalTalk network, use the HP LocalTalk Cable Kit (part number, J4135A). You will need a kit for each printer and an additional kit for each Macintosh computer on the network.

UNIX and Linux networks

Use the HP Jetdirect printer installer for UNIX utility to set up the printer on HP-UX or Sun Solaris networks.

For setup and management on UNIX or Linux networks, use HP Web Jetadmin.

To obtain HP software for UNIX and Linux networks, visit HP Customer Care online at www.hp.com/support/net_printing. For other installation options that the HP Jetdirect print server supports, see the *HP Jetdirect Print Server Administrator's Guide* that is included with printers equipped with the HP Jetdirect print server.

Wireless printing

Wireless networks offer a safe, secure, and cost-effective alternative to traditional wired network connections.

IEEE 802.11b standard

By using the wireless HP Jetdirect 802.11b external print server, HP peripherals can be placed anywhere in the office or home and connected to a wireless network running Microsoft, Apple, Netware, UNIX, or Linux network operating systems. This wireless technology provides a high-quality

printing solution without the physical constraints of wiring. Peripherals can be conveniently placed anywhere in an office or home and can be easily moved without changing network cables.

Installation is easy with the HP Install Network Printer Wizard.

HP Jetdirect 802.11b print servers are available for USB and parallel connections.

Bluetooth

NOTE Bluetooth wireless technology[1] is not supported for the Macintosh operating system.

Bluetooth wireless technology[1] is a low-power, short-range radio technology that can be used to wirelessly connect computers, printers, personal digital assistants (PDAs), cell phones, and other devices.

Unlike infrared technology, Bluetooth's reliance on radio signals means that devices do not have to be in the same room, office, or cubicle or have an unobstructed line of sight in order to communicate. This wireless technology increases portability and efficiency within business network programs.

HP Color LaserJet 4650 printer models use a Bluetooth adapter (hp bt1300) to incorporate Bluetooth wireless technology. The adapter is available for either USB or parallel connections. The adapter has a 10-meter operation range in the 2.5 GHz ISM band and can achieve data transfer rates up to 723 Kbps. The device supports the following Bluetooth profiles:

- Hardcopy Cable Replacement Profile (HCRP)
- Serial Port Profile (SPP)
- Object Push Profile (OPP)
- Basic Imaging Profile (BIP)
- Basic Printing Profile (BPP) with xHTML-Print

[1] The Bluetooth trademarks are owned by its proprietor and used by Hewlett-Packard company under licence.

Printer drivers

The optimal way to control the printer is by establishing settings in a software program or through the printer driver. Changing print settings in a software program affects only that particular print job. In most software programs, you can select print settings from menus within the program. Software program settings and printer driver settings override the settings on the printer control panel.

For best print quality, always use the printer driver to select the paper or media type. Different media types use different printer settings. For example, selecting transparencies in the driver causes the printer to use a color table that is designed for the best print quality on transparencies. Selecting transparencies also causes the printer to adjust printer speed and fuser temperature. Selecting heavy or glossy media for example, causes the printer to change the engine speed.

The printer driver also gives you customized control of color text, graphics, and photos. Use the printer driver to set the following color control options for the HP Color LaserJet 4600 Series printers:

See the printer driver online Help for details about color settings and how they affect printed output.

- Print in Grayscale
- Halftone options
- Neutral Grays
- Edge Control
- RGB Color

For the HP Color LaserJet 4610n and 4650 models only, you can also set the following options:

- **Driver Autoconfiguration**

  The HP LaserJet PCL 6 and PCL 5c drivers for Windows and the PS drivers for Windows 2000 and Windows XP feature automatic discovery and driver configuration for printer accessories at the time of installation. Some accessories that the Driver Autoconfiguration supports are the duplexing unit, optional paper trays, and dual inline memory modules (DIMMs). If the environment supports bidirectional communication, the installer presents Driver Autoconfiguration as an installed component by default for a Typical Installation and for a Custom Installation.

- **Update now**

  If you have modified the configuration of the HP Color LaserJet 4610n or 4650 printer since installation, the driver can be automatically updated with the new configuration in environments that support bidirectional communication. Click the **Update Now** button to automatically reflect the new configuration in the driver.

  NOTE The Update Now feature is not supported in environments where shared Windows NT 4.0, Windows 2000, or Windows XP clients are connected to Windows NT 4.0, Windows 2000, or Windows XP hosts.

- **HP Driver Preconfiguration**

  HP Driver Preconfiguration is a software architecture and set of tools that can be used to customize and distribute HP software in managed corporate printing environments. Using HP Driver Preconfiguration, information technology (IT) administrators can preconfigure the printing and device defaults for HP printer drivers before installing the drivers in the network environment.

For more information, see the *HP Driver Preconfiguration Support Guide*, which is available at www.hp.com/support/clj4600, www.hp.com/support/clj4610, or www.hp.com/support/clj4650.

Go to the appropriate Web site and use your browser Find function to search for “HP Driver Preconfiguration” (do not use the quotation marks) to find the link to driver preconfiguration information.

Available drivers

Printer drivers allow you to gain access to the printer features and allow the computer to communicate with the printer (by using a printer language). Check the installation notes and Readme files on the printer CD-ROM for additional software and languages.

The following printer drivers are included with the printer. The most recent drivers are available at www.hp.com/go/clj4600_software, www.hp.com/go/clj4610_software, or www.hp.com/go/clj4650_software. Depending on the configuration of Windows-based computers, the installation program for the printer software automatically checks the computer for Internet access to obtain the latest drivers.

Operating system [1]	PCL 6	PCL 5c	PS	PPD [2]
Windows 98, Me	x	Web only	x	x
Windows NT 4.0	x	Web only	x	x
Windows 2000	x	Web only	x	x
Windows XP	x	Web only	x	x
Windows Server 2003	x	Web only	x	x
Macintosh OS			x	x

1 Not all features are available from all drivers or operating systems. See the online Help in the driver for available features.

2 PostScript Printer Description files.

NOTE If your system did not automatically check the Internet for the latest drivers during software installation, download them from www.hp.com/support/clj4600_software, www.hp.com/support/clj4610_software, or www.hp.com/support/clj4650_software.

You can obtain Model Scripts for UNIX and Linux by downloading them from the Internet. See the support flyer that came in the printer box.

OS/2 drivers are available from IBM and are packaged with OS/2.

NOTE If the printer driver you want is not on the printer CD-ROM or is not listed here, check the installation notes and Readme files to see if the printer driver is supported. If it is not supported, contact the manufacturer or distributor of the program you are using and request a driver for the printer.

Additional drivers

The following drivers are not included on the CD-ROM, but are available from the Internet or from HP Customer Care.

- PCL 5c printer drivers for Windows 98, Me, NT 4.0, 2000, XP, and Server 2003

  NOTE The HP Color LaserJet 4610n printer supports only Windows 2000 and Windows XP.

- OS/2 PCL 5c/6 printer driver
- OS/2 PS printer driver
- UNIX model scripts
- Linux drivers
- HP Open VMS drivers

NOTE The OS/2 drivers are available from IBM and are packaged with OS/2. They are not available for Traditional Chinese, Simplified Chinese, Korean, or Japanese languages.

Select the right printer driver for your needs

Select a printer driver based on the way that you use the printer. Certain printer features are available only in the PCL 6 drivers. See the printer driver Help for available features.

- Use the PCL 6 driver to take full advantage of printer features. For general office printing, the PCL 6 driver is recommended to provide optimum performance and print quality.
- Use the PCL 5c driver (available on the Web only) if backward compatibility with previous PCL printer drivers or older printers is necessary.
- Use the PS driver if you are printing primarily from PostScript-specific programs such as Adobe and Corel, for compatibility with PostScript Level 3 needs, or for PS font DIMM support.

NOTE The printer automatically switches between PS and PCL printer languages.

Printer driver Help

Each printer driver has Help screens that can be activated by using the Help button, the F1 button on the computer keyboard, or a question-mark symbol in the upper-right corner of the printer driver (depending on the Windows operating system used). These Help screens give detailed information about the specific driver. Printer driver Help is separate from your program Help.

Software for Macintosh computers

The HP installer provides PostScript Printer Description (PPD) files, Printer Dialog Extensions (PDEs), and the HP LaserJet Utility for use with Macintosh computers.

The embedded Web server can be used by Macintosh computers if the printer is connected to a network.

PPDs

Use PPDs, in combination with the Apple PostScript drivers, to gain access to the printer features and to allow the computer to communicate with the printer. An installation program for the PPDs, PDEs, and other software is provided on the CD-ROM. Use the appropriate PS driver that comes with the operating system.

HP LaserJet Utility

Use the HP LaserJet Utility to control features that are not available in the driver. The illustrated screens make selecting printer features easier than ever. Use the HP LaserJet Utility to do the following:

- Name the printer, assign it to a zone on a network, and download files and fonts.
- Configure and set the printer for Internet protocol (IP) printing.

NOTE The HP LaserJet Utility is not currently supported for OS X, but the utility is supported for the Classic environment.

Installing the printing system software

The following sections contain instructions for installing the printing system software.

The printer comes with printing system software and printer drivers on a CD-ROM. The printing system software on the CD-ROM must be installed in order to take full advantage of the printer features.

If you do not have access to a CD-ROM drive, you can download the printing system software from the Internet at www.hp.com/go/clj4600_software, www.hp.com/go/clj4610_software, or www.hp.com/go/clj4650_software.

NOTE Sample model scripts for UNIX (HP-UX, Sun Solaris) and Linux networks are available for download at www.hp.com/support. For more information about UNIX model scripts, go to http://www.hp.com/go/unixmodelscripts. For more information about Linux drivers , go to http://www.hp.com/go/linuxprinting.

You can download the latest software free of charge at www.hp.com/go/clj4600_software, www.hp.com/go/clj4610_software, or www.hp.com/got/clj4650_software.

Installing Windows printing system software for direct connections

NOTE Only the HP LaserJet 4610n and 4650 models support the USB cable connection described in this section.

This section explains how to install the printing system software for Microsoft Windows 98, Windows Me, Windows NT 4.0, Windows 2000, and Windows XP.

NOTE The HP Color LaserJet 4610n printer supports only Windows 2000 and Windows XP.

When installing the printing software in a direct-connect environment, always install the software before connecting the parallel or USB cable. If the parallel or USB cable was connected before the software installation, see Installing the software after the parallel or USB cable has been connected.

Either a parallel or USB cable can be used for the direct connection. However, you cannot connect both the parallel and USB cable at the same time. Use an IEEE 1284-C cable or a standard 2-meter USB cable.

NOTE Windows NT 4.0 does not support USB cable connections for the HP Color LaserJet 4650 models.

To install the printing system software

1 Close all software programs that are open or running.

2 Insert the printer CD-ROM into the CD-ROM drive.

If the welcome screen does not open, start it by using the following procedure:

- On the **Start** menu, click **Run**.
- Type the following: x:\setup (where x is the letter of the CD-ROM drive).
- Click **OK**.

3 When prompted, click **Install Printer** and follow the instructions on the computer screen.

4 Click **Finish** when the installation has been completed.

5 You might need to restart the computer.

6 Print a Test Page or a page from any software program to make sure that the software is correctly installed.

If installation fails, reinstall the software. If this fails, check the installation notes and Readme files on the printer CD-ROM or the flyer that came in the printer box, or go to www.hp.com/support/clj4600, www.hp.com/support/clj4610, or www.hp.com/support/clj4650 for help or more information.

Installing Windows printing system software for networks

The software on the printer CD-ROM supports network installation with a Microsoft network. For network installation on other operating systems, go to www.hp.com/support/clj4600, www.hp.com/support/clj4610, or at www.hp.com/support/clj4650.

The HP Jetdirect print server that is included with the HP LaserJet 4650n, HP LaserJet 4650dn, or HP LaserJet 4650dtn printer has a 10/100 Base-Tx network port. If you need an HP Jetdirect print server with another type of network port, go to www.hp.com/support/clj4600, www.hp.com/support/clj4610, or www.hp.com/support/clj4650.

The installer does not support printer installation or printer object creation on Novell servers. It supports only direct-mode network installations between Windows computers and a printer. To install your printer and create objects on a Novell server, use an HP utility (such as HP Web Jetadmin or HP Install Network Printer Wizard) or a Novell utility (such as NWadmin).

To install the printing system software

1. If you are installing the software on Windows NT 4.0, Windows 2000, or Windows XP, make sure that you have administrator privileges.

   NOTE The HP Color LaserJet 4610n printer supports only Windows 2000 and Windows XP.

2. Make sure that the HP Jetdirect print server is configured correctly for the network by printing a configuration page. On the second page, locate the printer IP address. You might need this address to complete network installation.

   NOTE For the HP Color LaserJet 4610n, print a configuration page for the HP Jetdirect 175x external print server. See the information that came with the HP Jetdirect 175x external print server for instructions.

3. Close all software programs that are open or running.
4. Insert the printer CD-ROM into the CD-ROM drive.

   If the welcome screen does not open, start it by using the following procedure:

   a. On the **Start** menu, click **Run**.

   b. Type the following: x:\setup (where x is the letter of the CD-ROM drive).

   c. Click **OK**.

5. When prompted, click **Install Printer** and follow the instructions on the computer screen.
6. Click **Finish** when the installation has been completed.
7. You might need to restart the computer.
8. Print a Test Page or a page from any software program to make sure that the software is correctly installed.

NOTE If installation fails, reinstall the software. If this fails, check the installation notes and Readme files on the printer CD-ROM or the flyer that came in the printer box, or go to www.hp.com/support/clj4600, www.hp.com/support/clj4610, or at www.hp.com/support/clj4650 for help or more information.

To set up Windows-sharing to use the printer on a network

If the printer is directly connected to a computer with a parallel cable, you can share the printer on the network so that other network users can print to it.

See your Windows documentation to make Windows-sharing available. After the printer is shared, install the printer software on all computers that share the printer.

Installing Macintosh printing system software for networks

This section describes how to install Macintosh printing system software. The printing system software supports Apple Mac OS version 9.1.*x* and later.

The printing system software includes the following components:

- **PostScript Printer Description (PPD) files**

  The PPDs, in combination with the Apple PostScript printer drivers, provide access to printer features. An installation program for the PPDs and other software is provided on the CD-ROM that came with the printer. Use the appropriate PS driver that comes with the operating system.

- **HP LaserJet Utility**

  The HP LaserJet Utility provides access to features that are not available in the printer driver. Use the illustrated screens to select printer features and complete the following tasks with the printer:

  - Name the printer.
  - Assign the printer to a zone on the network.
  - Assign an IP to the printer.
  - Download files and fonts.
  - Configure and set the printer for IP or AppleTalk printing.

NOTE The HP LaserJet Utility is not currently supported for OS X, but the utility is supported for the Classic environment.

To install printer drivers from Mac OS 9.1*x* and later

1. Connect the network cable between the HP Jetdirect print server and a network port.
2. Insert the CD-ROM into the CD-ROM drive. The CD-ROM menu runs automatically. If the CD-ROM menu does not run automatically, double-click the CD-ROM icon on the desktop, and then double-click the Installer icon. This icon is located in the Installer/<language> folder of the Starter CD-ROM (where <language> is your language preference). For example, the Installer/English folder contains the Installer icon for the English printer software.
3. Follow the instructions on the computer screen.
4. Open the Apple Desktop Printer Utility located in the {Startup Disk}:Applications: Utilities folder.
5. Double-click **Printer (AppleTalk)**.
6. Next to AppleTalk Printer Selection, click **Change**.
7. Select the printer, click **Auto Setup**, and then click **Create**.
8. On the **Printing** menu, click **Set Default Printer**.

NOTE The icon on the desktop will appear to be generic. All the print panels appear in the **Print** dialog box in a program.

To install printer drivers from Mac OS X 10.x

1 Connect the network cable between the HP Jetdirect print server and a network port.

2 Insert the CD-ROM into the CD-ROM drive. The CD-ROM menu runs automatically. If the CD-ROM menu does not run automatically, double-click the CD-ROM icon on the desktop, and then double-click the Installer icon. This icon is located in the Installer/<language> folder of the Starter CD-ROM (where <language> is your language preference). (For example, the Installer/English folder contains the Installer icon for the English printer software.)

3 Double-click the **HP LaserJet Installers** folder.

4 Follow the instructions on the computer screen.

5 Double-click the Installer icon for the appropriate language.

6 On your computer hard drive, double-click **Applications**, **Utilities**, and then **Print Center**.

7 Click **Add Printer**.

8 Select the AppleTalk connection type in OS X 10.1 and the Rendezvous connection type in OS X 10.2.

9 Select the printer name.

10 Click **Add Printer**.

11 Close the Print Center by clicking the close button in the upper-left corner.

NOTE Macintosh computers cannot be connected directly to the printer by using a parallel port.

Installing Macintosh printing system software for direct connections (USB, HP Color LaserJet 4610n and 4650 models only)

NOTE Macintosh computers do not support parallel port connections.

This section explains how to install the printing system software for Mac OS 9.*x* and later.

The Apple LaserWriter driver must be installed to use the PPD files. Use the Apple LaserWriter 8 driver that came with your Macintosh computer.

To install the printing system software

1 Connect a USB cable between the USB port on the printer and the USB port on the computer. Use a standard 2-meter USB cable.

2 Close all software programs that are open or running.

3 Insert the printer CD-ROM into the CD-ROM drive and run the installer.

The CD-ROM menu runs automatically. If the CD-ROM menu does not run automatically, double-click the CD-ROM icon on the desktop, and then double-click the Installer icon. This icon is located in the Installer/<language> folder of the Starter CD-ROM (where <language> is your language preference).

4 Follow the instructions on the computer screen.

5 Restart the computer.

6 For Mac OS 9.*x* and later:

   a From HD/Applications/Utilities, open the Apple Desktop Printer Utility.

   b Double-click **Printer (USB)**.

   c Next to **USB Printer Selection**, click **Change**.

   d Select the printer, click **Auto Setup**, and then click **Create**.

   e Click the Desktop Printer Icon that was just created.

   f On the **Printing** menu, click **Set Default Printer**.

   For Mac OS X: From HD/Applications/Utilities/Print Center, start the Print Center. If the printer does not set up automatically, do the following:

   a Click **Add Printer**.

   b From within the printer list, select USB as the connection type.

   c Select the printer and then click **Add** in the lower-left corner.

7 Print a Test Page or a page from any software program to make sure that the software is correctly installed.

NOTE If installation fails, reinstall the software. If this fails, see the installation notes or Readme files on the printer CD-ROM or the flyer that came in the printer box, or go to www.hp.com/support/clj4600, www.hp.com/support/clj4610, or www.hp.com/support/clj4650 for help or more information.

NOTE The icon on the desktop will appear to be generic. All the print panels appear in the **Print** dialog box in a program.

Installing the software after the parallel or USB cable has been connected

NOTE Only the HP LaserJet 4610n and 4650 models support the USB cable connection described in this section.

If you have already connected a parallel or USB cable to a Windows computer, the **New Hardware Found** dialog box appears when you turn on the computer.

To install the software for Windows 98 or Windows Me (HP CLJ 4650 only)

1 In the **New Hardware Found** dialog box, click **Search CD-ROM drive**.

2 Click **Next**.

3 Follow the instructions on the computer screen.

4 Print a Test Page or a page from any software program to make sure that the software is correctly installed.

NOTE If installation fails, reinstall the software. If this fails, check the installation notes and Readme files on the printer CD-ROM or the flyer that came in the printer box, or go to www.hp.com/support/clj4600, www.hp.com/support/clj4610, or www.hp.com/support/clj4650 for help or more information.

To install the software for Windows 2000, Windows XP, or Windows 2003

1 In the **New Hardware Found** dialog box, click **Search**.

2 On the **Locate Driver Files** screen, select the **Specify a Location** check box, click to clear all of the other check boxes, and then click **Next**.

3 Type the letter for the root directory. For example, X:\ (where "X:\" is the letter of the root directory on the CD-ROM drive).

4 Click **Next**.

5 Follow the instructions on the computer screen.

6 Click **Finish** when the installation has been completed.

7 Select a language and follow the instructions on the computer screen.

8 Print a Test Page or a page from any software program to make sure that the software is correctly installed.

NOTE If installation fails, reinstall the software. If this fails, check the installation notes and Readme files on the printer CD-ROM or the flyer that came in the printer box, or go to www.hp.com/support/clj4600, www.hp.com/support/clj4610, or www.hp.com/support/clj4650 for help or more information.

Network configuration

Use the information in this section to configure the printer for use in a network.

Configuring the printer for the network

You can configure certain network parameters on the printer from the printer control panel or, for most networks, from the HP Web Jetadmin software (or the HP LaserJet Utility for Macintosh). HP Web Jetadmin software is available at www.hp.com/go/webjetadmin_software.

For a complete list of supported networks and for instructions to configure network parameters from software such as HP Web Jetadmin, see the *HP Jetdirect Print Server Software Installation Guide.* The guide comes on the CD-ROM with printers in which an HP Jetdirect 610N print server is installed.

Configuring Novell NetWare frame type parameters

The HP Jetdirect 610N (HP Color LaserJet 4600 models), the HP Jetdirect 175x external print server (HP Color LaserJet 4610n printer), or the HP Jetdirect 620N (HP Color LaserJet 4650 models) print server automatically selects a NetWare frame type. Select a frame type manually only when the print server selects an incorrect frame type. To identify the frame type that the print server selected, print a configuration page.

Software for networks

For a summary of available HP network installation and configuration software solutions, see the *HP Jetdirect Print Server Administrator's Guide*. You can find this guide on the CD-ROM included with the printer.

HP Web Jetadmin

Use HP Web Jetadmin to manage HP Jetdirect connected printers within your intranet by using a browser. HP Web Jetadmin is a browser-based management tool, and should be installed only on a single network administration server. It can be installed and run on Red Hat Linux; Suse Linux; Windows NT 4.0 Server (not available for the HP CLJ 4610n printer) and Workstation; Windows 2000 Professional, Server, and Advanced Server; and Windows XP Professional Service Pack 1 systems.

To download a current version of HP Web Jetadmin and for the latest list of supported host systems, visit HP Customer Care Online at www.hp.com/go/webjetadmin_software.

When installed on a host server, any client can open HP Web Jetadmin through a supported Web browser (such as Microsoft Internet Explorer 5.5 and 6.0 or Netscape Navigator 7.0).

HP Web Jetadmin has the following features:

- The task-oriented user interface provides configurable views, saving network managers significant time.
- Customizable user profiles let network administrators include only the function that is viewed or used.
- Instant e-mail notification of hardware failure, low supplies, and other printer problems can be routed to different people.
- Remote installation and management is available from anywhere by using only a standard Web browser.
- Advanced autodiscovery locates peripherals on the network, without manually entering each printer into a database.
- The software accommodates simple integration into enterprise management packages.
- You can quickly find peripherals based on parameters such as IP address, color capability, and model name.
- You can easily organize peripherals into logical groups, with virtual office maps for easy navigation.
- You can manage and configure multiple printers at one time.

For the latest information about HP Web Jetadmin go to www.hp.com/go/webjetadmin.

UNIX

The HP Jetdirect Printer Installer for UNIX is a simple printer installation utility for HP-UX and Solaris networks. It is available for download from HP Customer Care Online at www.hp.com/support/net_printing.

Utilities

HP Color LaserJet 4600 Series printers are equipped with several utilities that make them easy to monitor and manage on a network.

Embedded Web server (HP Color LaserJet 4600 and 4650 models only)

This printer is equipped with an embedded Web server that provides access to information about printer and network activities. A Web server provides an environment in which Web programs can run, in much the same way that an operating system, such as Windows, provides an environment in which programs can run, on your computer. The output from these programs can then be viewed in a Web browser, such as Microsoft Internet Explorer or Netscape Navigator.

When a Web server is "embedded," it resides on a hardware device (such as a printer) or in firmware, rather than being available as software that is loaded on a network server.

The advantage of an embedded Web server is that it provides an interface to the printer that anyone who has a network-connected computer or a standard Web browser can use. There is no special software to install or configure. For more information about the HP embedded Web server, see the *Embedded Web Server User Guide*. You can find this guide on the CD-ROM that is included with the printer.

Features

Use the HP embedded Web server to view printer and network card status and manage printing functions from your computer. With the HP embedded Web server, you can do the following:

- View printer status information.
- Determine the remaining life on all supplies and order new ones.
- View and change tray configurations.
- View and change the printer control-panel menu configuration.
- View and print internal pages.
- Receive notification of printer and supplies events.
- Add or customize links to other Web sites.
- Select the language in which to show the embedded Web server pages.
- View and change network configuration.

HP Toolbox (HP Color LaserJet 4650 models only)

The HP Toolbox is a software program that can be used for the following tasks:

- Check the printer status.
- View troubleshooting information.
- View online documentation.
- Print internal printer pages.

You can view the HP Toolbox when the printer is directly connected to your computer or when it is connected to a network. You have to perform a complete software installation before you can use the HP Toolbox.

Other components and utilities

Several software programs are available for Windows and Macintosh users, as well as for network administrators. These programs are summarized in the following table.

Windows	Macintosh OS	Network administrator
■ Software installer — automates the printing system installation ■ Online Web registration ■ HP Toolbox (HP Color LaserJet 4650 models only)	■ PostScript Printer Description files (PPDs) — for use with the Apple PostScript drivers that comes with the Mac OS ■ HP LaserJet Utility (available from the Internet) — a printer management utility for Mac OS users ■ HP Toolbox (for Mac OS X V10.2 and later; HP Color LaserJet 4650 models only)	■ HP Web Jetadmin — a browser-based system management tool. See www.hp.com/go/webjetadmin for the latest HP Web Jetadmin software ■ HP Jetdirect Printer Installer for UNIX — available for download from www.hp.com/support/net_printing

Setting network security on the printer

This printer features control-panel locking, which allows network administrators to prevent users from changing certain printer control-panel settings. When a menu is locked, unauthorized users trying to change settings at the printer control panel will see the following message:

ACCESS DENIED MENUS LOCKED

Administrators can use HP Web Jetadmin software, the HP LaserJet Utility for Macintosh, or an ASCII escape sequence to perform this procedure. For instructions to lock the printer control panel by using either the HP Web Jetadmin software or the HP LaserJet Utility for Macintosh, see the online Help.

Locking the control panel

Network administrators can prevent users from changing printer control-panel settings by establishing a password and locking the printer control panel. Administrators can choose from multiple levels of security and can lock certain control panel menus, allowing users to change the rest of the menus, or lock all of the menus (including the CANCEL JOB [HP Color LaserJet 4600 models] or STOP [HP Color LaserJet 4610n and 4650 models] button).

Levels of security

Lock setting	Control-panel items locked
OFF	**Service** menu (locked with a factory-set PIN)
LOW	**I/O** submenu
	System Setup submenu
	Resets submenu
	Service menu (locked with a factory-set PIN)
MEDIUM	**Configure Device** menu (including all submenus)
	Diagnostics menu
	Service menu (locked with a factory-set PIN)
HIGH	**Information** menu
	Paper Handling menu
	Configure Device menu (including all submenus)
	Diagnostics menu
	Service menu (locked with a factory-set PIN)
	CANCEL JOB button (HP Color LaserJet 4600 models)
	STOP button (HP Color LaserJet 4610n and 4650 models)

Using an ASCII PJL escape sequence to set network security

If you decide to use the ASCII escape sequence, you must use an MS-DOS or Windows ASCII editor to create the commands. The commands must also be sent to the printer by using a DOS COPY command or an ASCII file download utility. The *PJL Technical Reference Manual* is located on CD-ROM (part number 5961-0976). Order a copy of this manual from the HP Web site: www.hp.com.

NOTE In the following examples, EC represents the escape character. For more information about using escape characters, see the *PJL Technical Reference Manual*.

- To lock or unlock the printer control panel if a password has not been set, send the following ASCII sequence to the printer:

EC%-12345x@PJL JOB

@PJL DEFAULT CPLOCK=NONE (or MINIMUM, MODERATE, or MAXIMUM)

@PJL EOJ

EC%-12345x

- To set the password, send the following ASCII sequence to the printer:

EC%-12345x@PJL JOB

@PJL DEFAULT PASSWORD=[numeric password (0 to 65535)]

@PJL EOJ

EC%-12345x

- To lock or unlock the control panel if the password has been set, send the following ASCII sequence to the printer:

EC%-12345x@PJL JOB PASSWORD=(numeric password)

@PJL DEFAULT CPLOCK=NONE (or MINIMUM, MODERATE, or MAxIMUM)

@PJL EOJ

EC%-12345x

4 Maintenance

This chapter provides information about the following topics:

- Cleaning the printer and accessories
- Approximate replacement intervals for supply items
- Locating supplies
- Replacing supply items
- Printer memory (HP Color LaserJet 4600 models)
- Printer memory (HP Color LaserJet 4610n and 4650 models)
- Installing an HP Jetdirect print server card (HP Color LaserJet 4600 and 4650 models only)
- Installing an HP Jetdirect print server card (HP Color LaserJet 4610n model)

Cleaning the printer and accessories

Clean the outside surfaces with a water-dampened cloth. Observe the warning and caution below.

WARNING! Before you begin these steps, turn the printer off and unplug all power cords to avoid shock hazard. Be careful when cleaning around the fuser area. It might be hot.

CAUTION To avoid permanent damage to the print cartridge, do not use ammonia-based cleaners on or around the printer. If toner gets on your clothes, wipe it off with a dry cloth and wash your clothes in cold water. Hot water sets toner into fabric.

Component	Cleaning method
Outside covers	Use an HP Toner Cleaning Cloth (part number 5090-3379) or a water-dampened cloth. Do not use solvents or ammonia-based cleaners.
Inside general	With a dry lint-free cloth, wipe any dust, spilled toner, and paper particles from the paper path area, the registration roller, and the print cartridge cavity.
ETB attaching roller	Clean with lint-free paper. If dirt cannot be removed, dampen the paper with alcohol.
Paper pickup rollers	Clean with lint-free paper. If dirt cannot be removed, dampen the paper with alcohol.
Color registration detection unit	Clean with lint-free paper. If dirt cannot be removed, dampen the paper with alcohol.

Cleaning spilled toner

Defective print cartridges can develop leaks. Also, after a paper jam has occurred, some toner might remain on the rollers and guides inside the printer. The pages that print immediately after the jam can pick up this toner. Use a vacume that is designed for picking up fine particles. See Vacuum specifications.

CAUTION When cleaning the printer, do not touch the ETB with the damp cloth or with your fingers.

Vacuum specifications

Do not vacuum the printer or any spilled toner using a conventional vacuum. Toner particles used in this product might be too fine for effective vacuuming and could result in damage to conventional vacuums.

A vacuum specifically designed for cleaning toner can be used if it is capable of filtering fine particles (5 microns in diameter).

Approximate replacement intervals for supply items

You can identify supply items by their labeling and their blue plastic handles. For instructions about installing supplies, see the installation guides that come with each supply item.

The following table lists the approximate replacement intervals for printer supply items and shows the control panel messages that prompt you to replace each item.

Table 4-1 Approximate replacement intervals for supply items

Supply item	Printer message	Page counts	Approximate replacement interval[1]	To install or order
Black (K) print cartridge	**REPLACE BLACK CARTRIDGE**	9,000 pages[2]	2.7 months	Installing the print cartridges For part numbers, see Supplies and accessories in chapter 8.
Cyan (C) print cartridge	**REPLACE CYAN CARTRIDGE**	8,000 pages[2]	2.7 months	Installing the print cartridges For part numbers, see Supplies and accessories in chapter 8.
Magenta (M) print cartridge	**REPLACE MAGENTA CARTRIDGE**	8,000 pages[2]	2.7 months	Installing the print cartridges For part numbers, see Supplies and accessories in chapter 8.
Yellow (Y) print cartridge	**REPLACE YELLOW CARTRIDGE**	8,000 pages[2]	2.7 months	Installing the print cartridges For part numbers, see Supplies and accessories in chapter 8.
Image transfer kit (ETB)	**REPLACE TRANSFER KIT**	120,000 pages[3]	40 months	Replacing the transfer unit For part numbers, see Supplies and accessories in chapter 8.
Image fuser kit	**REPLACE FUSER KIT**	150,000 pages [3]	50 months	Replacing the fuser For part numbers, see Supplies and accessories in chapter 8.

1 Approximate life expectancies based on 3,000 pages per month.

2 The approximate average A4/Letter-size page count is based on 5% coverage of individual colors. Page counts are only estimations; usage conditions and print patterns cause results to vary.

3 Page counts are only estimations; usage conditions and print patterns cause results to vary.

CAUTION Hewlett-Packard Company recommends the use of HP products in this printer. Use of non-HP products can cause problems that require service that is not covered by the Hewlett-Packard warranty or service agreements.

ETB life under different circumstances

Depending on the printer workload, the customer will need to replace the ETB once or twice in the life of the printer. In order to help plan supplies purchases, the HP Color LaserJet 4600 Series printer calculates an estimated remaining number of pages that can be printed with the ETB. This number appears on the Supplies Status page under Transfer Kit: HP Part Number: HP C9724A for the HP Color LaserJet 4600 models or HP Q3675 for the HP Color LaserJet 4610n and 4650 models (for exchange part numbers, see chapter 8). You can view the Supplies Status page by printing it from the printer control panel. If the printer is connected to the network, you can also view the page in the Web browser or through the HP Web Jetadmin software.

The number of pages an ETB can print is a function of two factors:

- The number of times the belt goes from a stationary to a rotating state (spins up)
- The number of pages that have been printed on the belt

Unless print jobs are queued back to back, each print job requires the belt to spin up.

Think of the ETB as having a limited number of wear units. It has 200,000 wear units when it is new. Each time the belt spins up, it uses two wear units. Each time it prints a page, the belt uses one wear unit.

Because most print jobs are not queued, the average number of pages per job, or job length, is a factor in how quickly the ETB will wear out. The shorter the average job, the more quickly the ETB will wear out.

Figure 4-1 ETB total page count according to average job length shows how many pages an ETB will print, given various average job lengths.

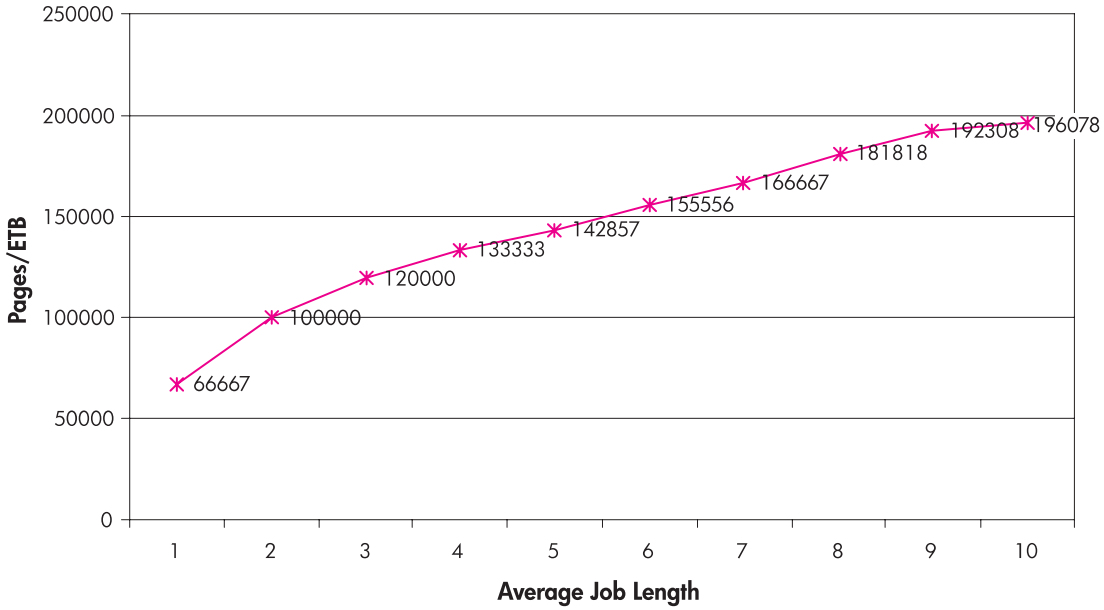


Figure 4-1 ETB total page count according to average job length

The printer assumes an average print job length of three pages to estimate how many pages are remaining on the ETB. With an average job length of three pages, the ETB will print 120,000 pages.

If all print jobs are exactly three pages long, for each page printed the number of estimated pages remaining would decrease by one, beginning with the maximum 120,000 pages. If the job length is

less than three pages, the estimated-pages-remaining number decreases more quickly than the rate at which the number of pages actually printed increases. If the job length is greater than three pages, the number of pages remaining decreases less quickly than the rate at which the actual number of pages printed increases.

Locating supplies

Use Figure 4-2 Location of supplies to locate each supply item.

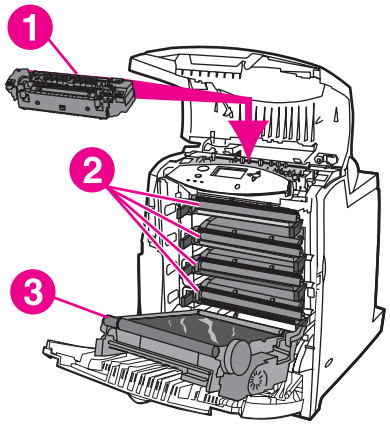


Figure 4-2 Location of supplies

1	Fuser
2	Print cartridges
3	Transfer unit (ETB)

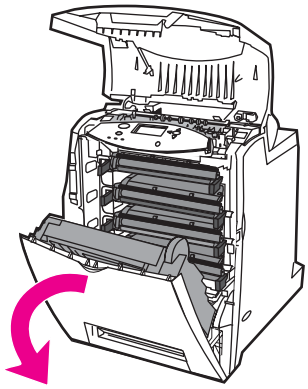
Replacing supply items

Use the following instructions to replace the supplies.

Changing print cartridges

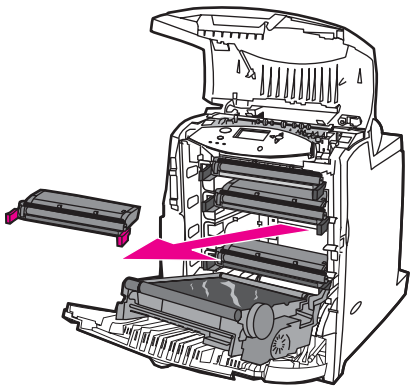
Replace a print cartridge when a **REPLACE <COLOR> CARTRIDGE** message appears on the control-panel display. The control-panel display also indicates the color that should be replaced (unless a genuine HP cartridge is not currently installed).

1 Open the top cover. Grasp the green handle on the transfer unit and pull it down. The front cover opens as you pull down the transfer unit.

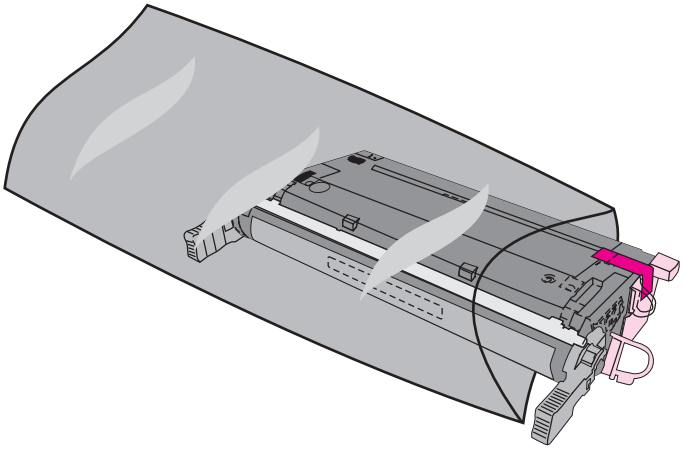


CAUTION Do not place anything on the transfer unit while it is open. If the transfer unit is punctured, print quality problems can result.

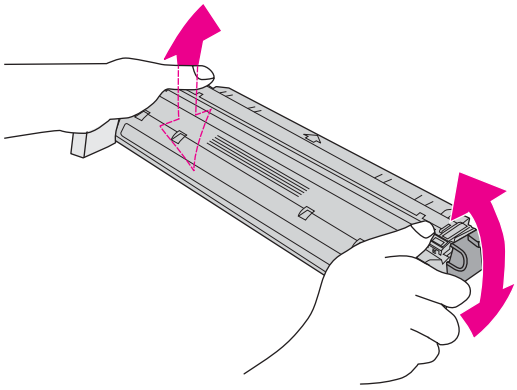
2 Remove the used print cartridge from the printer.



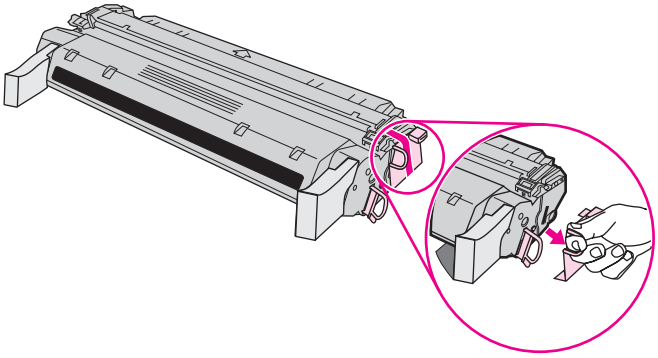
3 Remove the replacement print cartridge from the bag. Place the used print cartridge in the bag for recycling.



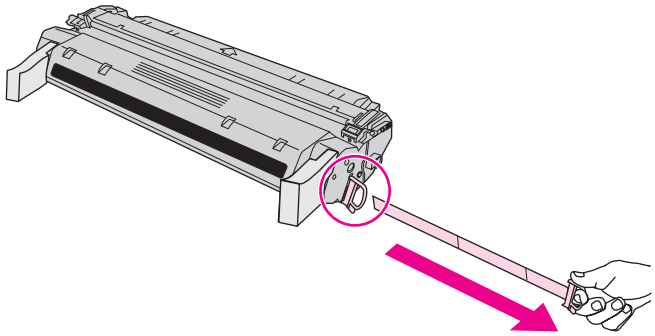
4 Grasp both sides of the cartridge and distribute the toner by gently rocking the cartridge from side to side.



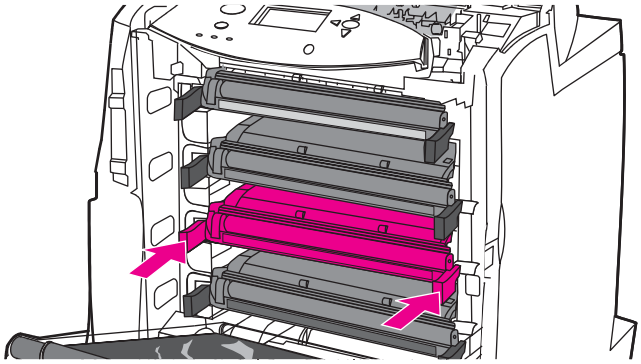
5 Remove the tape from the orange shipping lock. Remove and discard the orange shipping lock.



6 Remove the inside sealing tape by pulling the orange loop on the end and pulling the tape completely out. Discard the tape.



7 Grasp the blue handles on the sides of the print cartridge. Align the print cartridge with the tracks inside the printer and insert the cartridge until it is completely seated.



8 Installation is complete. Place the used print cartridge in the box in which the new cartridge arrived. See the enclosed recycling guide for recycling instructions.

Replacing the transfer unit

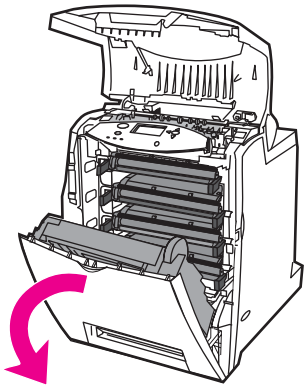
Replace the transfer unit when a **REPLACE TRANSFER KIT** message appears on the control-panel display.

NOTE If you replace the transfer unit when it is not at the end of life (for example, if it is defective) you will need to calibrate the printer and reset the transfer unit count through the control panel. See Replacing the transfer unit when it is not at end of life.

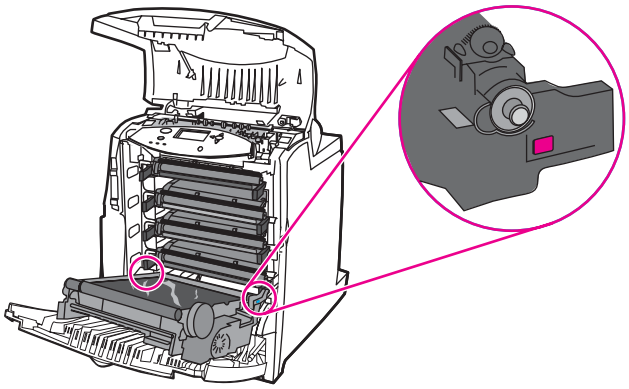
1 Turn the printer off.

2 Use the side handles to open the top cover.

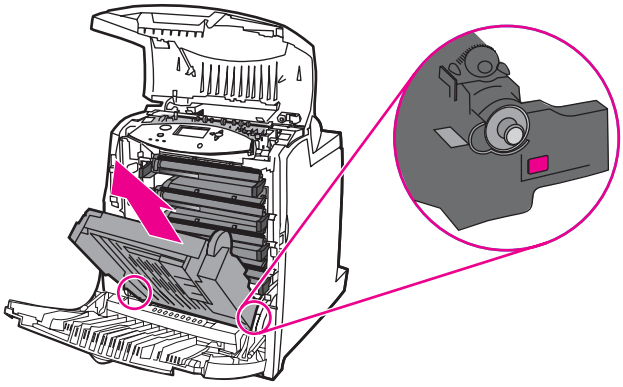
3 Grasp the green handle on the transfer unit and pull it down. The front cover opens as you pull down the transfer unit.



4 Locate the blue release buttons on each side of the transfer unit (near the bottom of the transfer unit).

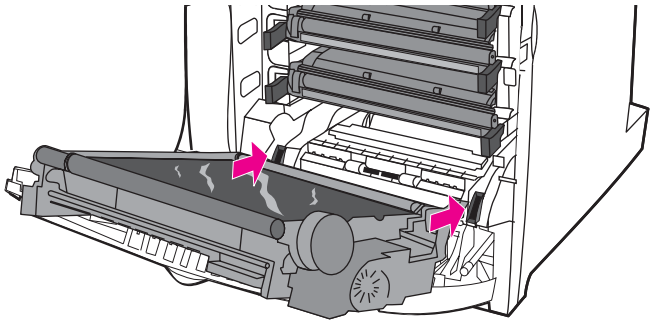


5 Grasp the transfer unit with two hands. Simultaneously press both of the blue buttons and slide the transfer unit out of the printer.



6 Remove the new transfer unit from the bag. Place the used transfer unit in the bag for recycling. See the enclosed recycling guide for recycling instructions.

7 Hold the transfer unit on either side. Guide the feet into the cups and slide the transfer unit into the printer.



8 Close the transfer unit and front cover. Close the top cover and turn the printer on. After a short while a **NEW TRANSFER KIT=** message appears on the control-panel display.

9 Press ▼ to highlight **YES**.

10 Press ✓ to reset the transfer unit count.

11 Wait for the printer to calibrate.

Replacing the transfer unit when it is not at end of life

If you replace the transfer unit when it is not at the end of life (for example, if it is defective) you will need to calibrate the printer and reset the transfer unit count through the control panel.

Use the following steps to calibrate the printer:

1 Press ✓ (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models) to open the **MENUS**.

2 Press ▼ to highlight **CONFIGURE DEVICE**.

3 Press ✓ to select **CONFIGURE DEVICE**.

4 Press ▼ to highlight **PRINT QUALITY**.

5 Press ✓ to select **PRINT QUALITY**.

6 Press ▼ to highlight **CALIBRATE NOW** (HP Color LaserJet 4600 models) or **FULL CALIBRATE NOW** (HP Color LaserJet 4610n and 4650 models).

7 Press ✓ to select **CALIBRATE NOW** (HP Color LaserJet 4600 models) or **FULL CALIBRATE NOW** (HP Color LaserJet 4610n and 4650 models).

8 Wait for the printer to calibrate.

Use the following steps to reset the transfer unit count:

1 Press ✓ (HP Color LaserJet 4600) or MENU (HP Color LaserJet 4610n and 4650 models) to open the **MENUS**.

2 Press ▼ to highlight **CONFIGURE DEVICE**.

3 Press ✓ to select **CONFIGURE DEVICE**.

4 Press ▼ to highlight **RESETS**.

5 Press ✓ to select **RESETS**.

6 Press ▼ to highlight **RESET SUPPLIES**.

7 Press ✓ to select **RESET SUPPLIES**.

8 Press ▼ to highlight **NEW TRANSFER KIT**.

9 Press ✓ to select **NEW TRANSFER KIT**.

10 Press ▼ to highlight **YES**.

11 Press ✓ to reset the transfer unit count.

Replacing the fuser

Replace the fuser when a **REPLACE FUSER KIT** message appears on the control-panel display.

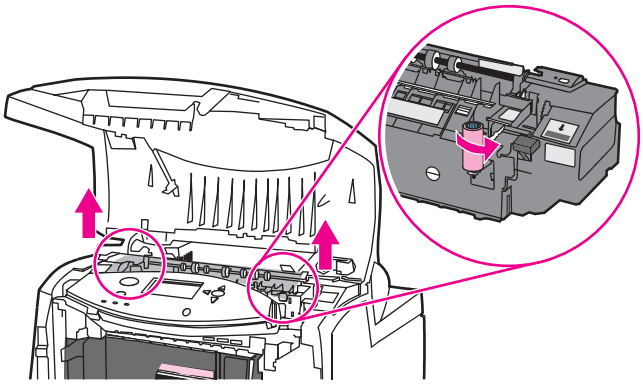
NOTE If you replace the fuser when it is not at the end of life (for example, if it is defective) you will need to calibrate the printer and reset the fuser count through the control panel. See Replacing the fuser when it is not at end of life.

1 Turn the printer off.

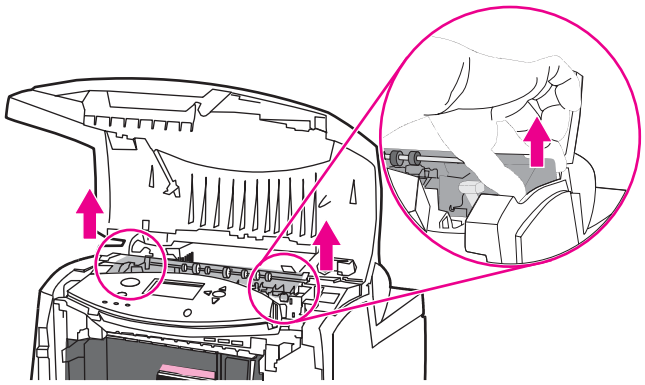
2 Use the side handles to open the top cover.

WARNING! The fuser might be hot. Wait 10 minutes before proceeding.

3 Completely loosen the blue thumb screws on each side of the fuser.

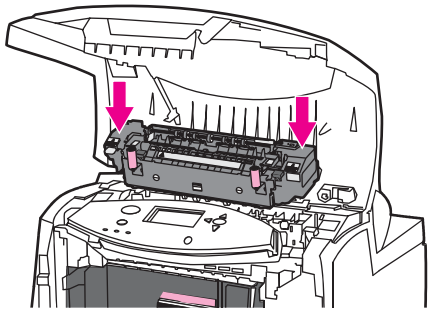


4 Grasp the ends and pull straight up to remove the fuser.

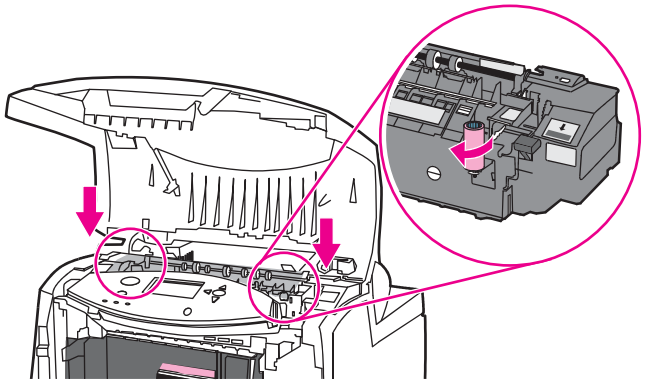


5 Remove the new fuser from the bag. Place the used fuser in the bag for recycling. See the enclosed recycling guide for recycling instructions.

6 Grasp the sides of the fuser and push down firmly into the printer.



7 Tighten the blue thumb screws.



8 Close the top cover, and turn the printer on. After a short while, a **NEW FUSER KIT=** message appears on the control-panel display.

9 Press ▼ to highlight **YES**.

10 Press ✓ to reset the fuser count.

Replacing the fuser when it is not at end of life

If you replace the fuser when it is not at the end of its life (for example, if it is defective) you will need to reset the fuser count through the control panel.

Use the following steps to reset the fuser count:

1. Press ✓ (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 printer) to open the **MENUS**.
2. Press ▼ to highlight **CONFIGURE DEVICE**.
3. Press ✓ to select **CONFIGURE DEVICE**.
4. Press ▼ to highlight **RESETS**.
5. Press ✓ to select **RESETS**.
6. Press ▼ to highlight **RESET SUPPLIES**.
7. Press ✓ to select **RESET SUPPLIES**.
8. Press ▼ to highlight **NEW FUSER KIT**.
9. Press ✓ to select **NEW FUSER KIT**.
10. Press ▼ to highlight **YES**.
11. Press ✓ to reset the fuser count.

Printer memory (HP Color LaserJet 4600 models)

The printer has five dual inline memory module (DIMM) slots.

NOTE For maximum flexibility in DIMM support, the formatter is designed with four 168-pin DIMM slots and a fifth 100-pin DIMM slot. Only four DIMMs can be loaded at a time, so the fifth DIMM slot (100-pin) is logically the same as the fourth DIMM slot (168-pin). The system can only have a DIMM installed on the fourth DIMM slot (168-pin) if no DIMM is installed in the fifth DIMM slot (100-pin), and vice versa.

Use these DIMM slots to upgrade the printer with the following accessories:

- More printer memory - DIMMs are available in 64, 128, and 256 MB
- Flash memory DIMMs - available in 8 MB; unlike standard printer memory, flash DIMMs can be used to permanently store downloaded items in the printer, even when the printer is off
- DIMM-based accessory fonts, macros, and patterns
- Other DIMM-based printer languages and printer options

NOTE Single inline memory modules (SIMMs) that were used on previous HP LaserJet printers are not compatible with the printer.

Before ordering additional memory, print a configuration page to see how much memory is currently installed.

1. Press ✓ to open the **MENUS**.
2. Press ▼ to highlight **INFORMATION**.
3. Press ✓ to select **INFORMATION**.
4. Press ▼ to highlight **PRINT CONFIGURATION**.
5. Press ✓ to select **PRINT CONFIGURATION**.

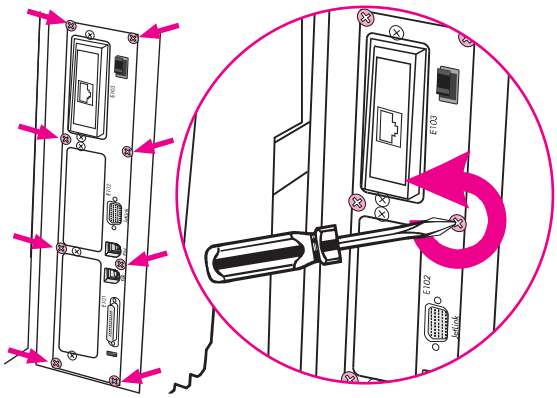
Installing memory and font DIMMs (HP Color LaserJet 4600 models)

You can install more memory for the printer, and you can also install a font DIMM so that the printer can print characters for languages such as Chinese or the Cyrillic alphabet.

CAUTION Static electricity can damage DIMMs. When handling DIMMs, either wear an antistatic wrist strap, or frequently touch the surface of the DIMM antistatic package and then touch bare metal on the printer.

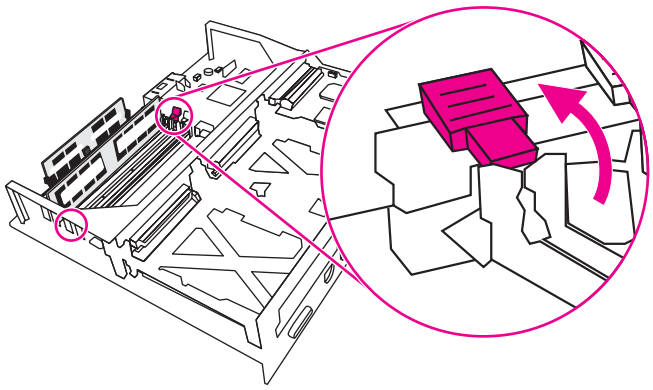
1. Turn the printer off, and disconnect all power and interface cables. Locate the formatter board in the rear of the printer.

2 Remove the eight screws holding the board in place, and set them aside.

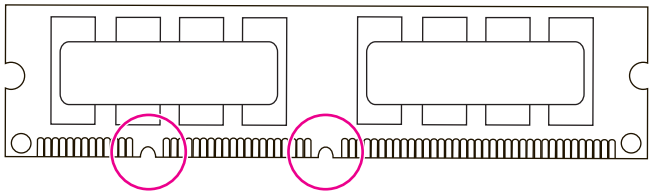


3 Slide out the formatter board and set it on a clean, flat, grounded surface.

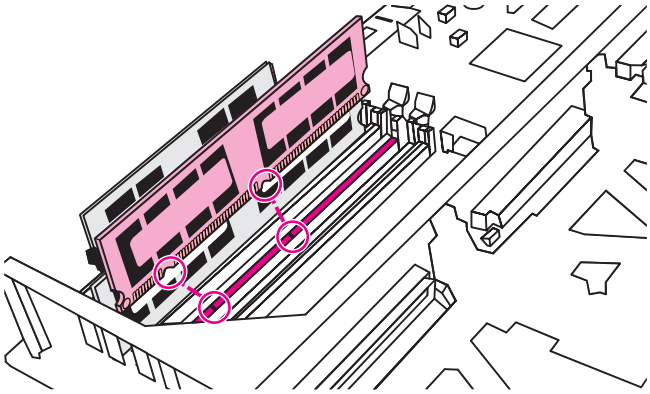
4 Release the locks on each side of the DIMM slot.



5 Remove the DIMM from the antistatic package. Locate the alignment notches on the bottom edge of the DIMM.

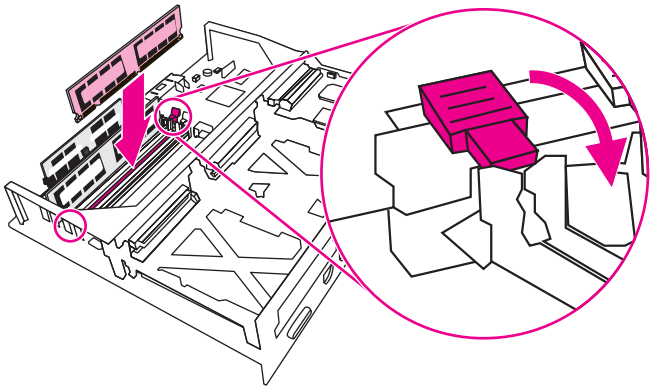


6 Holding the DIMM by the edges, align the notches on the DIMM with the bars in the DIMM slot.



NOTE If you have difficulty inserting the DIMM or closing the latches, make sure that the notches on the bottom of the DIMM are aligned with the bars in the slot. If the DIMM still does not go in, make sure that you are using the correct type of DIMM.

1 Firmly press the DIMM straight into the slot. Close the locks on each side of the DIMM until they snap into place.



2 Align the formatter board in the tracks at the top and bottom of the slot, and slide the board into the printer. Replace and tighten the eight screws that you removed in step 2.

3 Reconnect the power cable and interface cables, and turn the printer on.

Enabling memory (HP Color LaserJet 4600 models)

If you installed a memory DIMM, set the printer driver to recognize the newly added memory.

1 On the **Start** menu, point to **Settings**, and then click **Printers** or **Printers and Faxes**.

2 Select this printer and select **Properties**.

3 On the **Configure** tab, click **More**.

4 In the **Total Memory** field, type or select the total amount of memory that is now installed.

5 Click **OK**.

Enabling the language font DIMM (HP Color LaserJet 4600 models)

If you installed a language font DIMM in the printer, you must select the Font DIMM option in the printer driver in order for the font DIMM to work correctly. To enable fonts from the PCL 5c and PCL 6 printer drivers for Windows, follow this procedure:

1. On the **Start** menu, point to **Settings**, and then click **Printers**.
2. Select this printer and select **Properties**.
3. On the **Configure** tab, click **More**.
4. Select the **Font DIMM** check box.
5. In the **Configure Font DIMMs** dialog box, click **Add** to add the font file.
6. In the **Add Font DIMM** dialog box, browse to the location of the font file, select the font file, and then click **OK**.
7. In the **Configure Font DIMMs** dialog box, select the installed DIMM.
8. Click **OK**.

Checking DIMM installation (HP Color LaserJet 4600 models)

Verify that the DIMMs are installed correctly and are working.

1. Turn the printer on. Check that the Ready light is on after the printer has gone through the startup sequence. If an error message appears, a DIMM might be incorrectly installed.
2. Print a configuration page.
3. Check the Installed Personalities and Options section on the configuration page and compare it with the configuration page that you printed before the DIMM installation.
4. If the amount of recognized memory has not increased, one of the following conditions might exist:
   - The DIMM might not be installed correctly. Repeat the installation procedure.
   - The DIMM might be defective. Try a new DIMM.

Printer memory (HP Color LaserJet 4610n and 4650 models)

The HP Color LaserJet 4650 printer has two 200-pin DDR SDRAM slots. One slot is available for adding memory to the printer. The HP Color LaserJet 4610n printer has one 200-pin DDR SDRAM slot. To increase the printer memory, install a new memory module that has higher capacity. DDR SDRAM memory is available in 128, 256, and 512 MB modules.

NOTE HP Color LaserJet 4610n and 4650 models use 200-pin small outline dual inline memory modules (SODIMM) that support 128, 256, or 512 MB of RAM.

The HP Color LaserJet 4650 printer also has three flash memory card slots for printer firmware, fonts, and other solutions. The HP Color LaserJet 4610n does not include any available flash memory card slots.

- The first CompactFlash slot is reserved for printer firmware.

  NOTE Use the first flash memory card slot for firmware only. The slot is marked “Firmware Slot.”

- The two additional CompactFlash memory slots in the HP Color LaserJet 4650 printer enable the user to add fonts and third-party solutions, such as signatures and personalities. The slots are marked "Slot 2" and "Slot 3." For more information about the types of solutions available, go to www.hp.com/go/gsc.

NOTE Flash memory cards adhere to CompactFlash specifications and size.

CAUTION Do not insert a flash memory card that is designed for use with a digital camera into the printer. The printer does not support photo printing directly from a flash memory card. If you install a camera-type flash memory card, a message appears on the control-panel display asking if you want to reformat the flash memory card. If you choose to reformat the card, all data on the card will be lost.

You might want to increase the printer memory if you often print complex graphics or PS documents, or use many downloaded fonts. Additional memory also allows the printer to print multiple, collated copies at the maximum speed.

NOTE Single inline memory modules (SIMMs) and dual inline memory modules (DIMMs) that were used on previous HP LaserJet printers are not compatible with the printer.

Before ordering additional memory, see how much is currently installed by printing a configuration page. To order additional memory, see chapter 8.

Printing a configuration page (HP Color LaserJet 4610n and 4650 models)

1. Press MENU to open the **MENUS**.
2. Press ▼ to highlight **INFORMATION**.
3. Press ✓ to select **INFORMATION**.

4 Press ▼ to highlight **PRINT CONFIGURATION**.

5 Press ✓ to print the configuration page.

Installing memory (HP Color LaserJet 4610n and 4650 models) and fonts (HP Color LaserJet 4650 models)

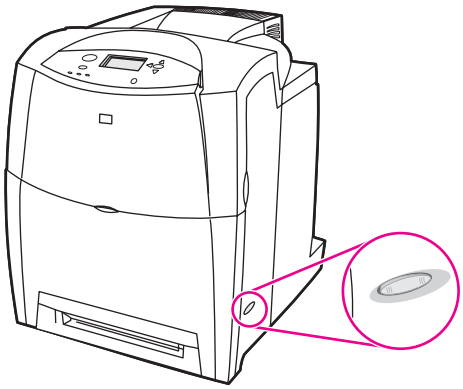
You can install more memory for the printer, and you can also install a font card so that the printer can print characters for languages such as Chinese or the Cyrillic alphabet.

CAUTION Static electricity can damage DIMMs. When handling DIMMs, either wear an antistatic wrist strap, or frequently touch the surface of the DIMM antistatic package and then touch bare metal on the printer.

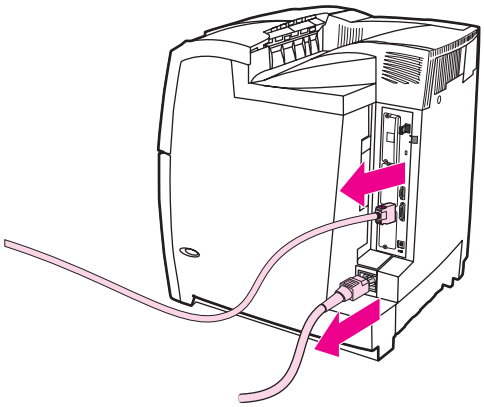
To install DDR memory DIMMs (HP Color LaserJet 4610n and 4650 models)

NOTE The back side of the HP CLJ 4650 model is shown in this procedure. The HP CLJ 4610n will appear slightly different, but the procedure for installing DDR memory DIMMs is the same for both models.

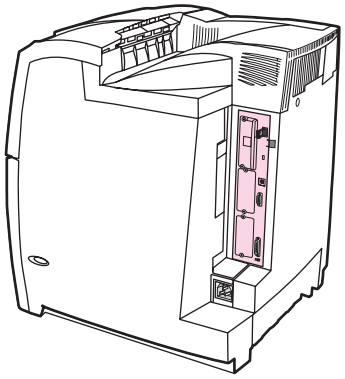
1 Turn the printer off.



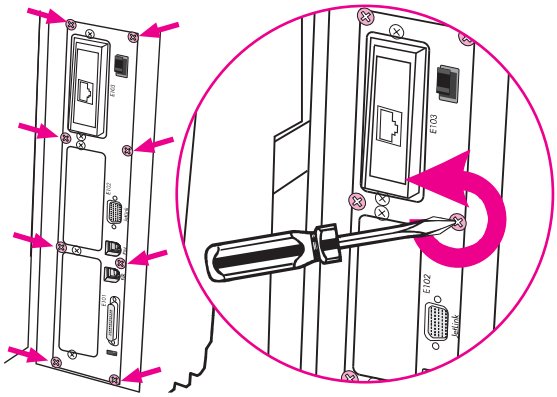
2 Disconnect all power and interface cables.



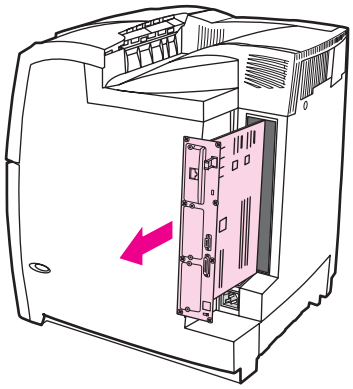
3 Locate the formatter board in the rear of the printer.



4 Using a #2 Phillips screwdriver, remove the eight screws holding the board in place, and set them aside.

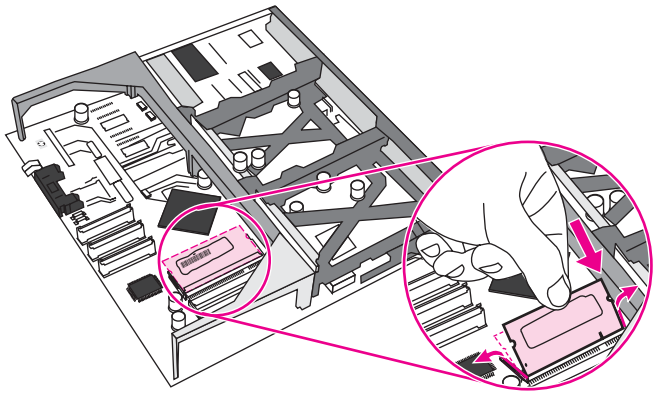


5 Slide out the formatter board and set it on a clean, flat, grounded surface.

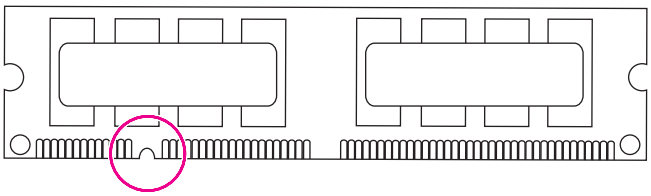


6 To replace a DDR DIMM that is currently installed, spread the latches apart on each side of the DIMM slot, lift the DDR DIMM up at an angle, and pull it out.

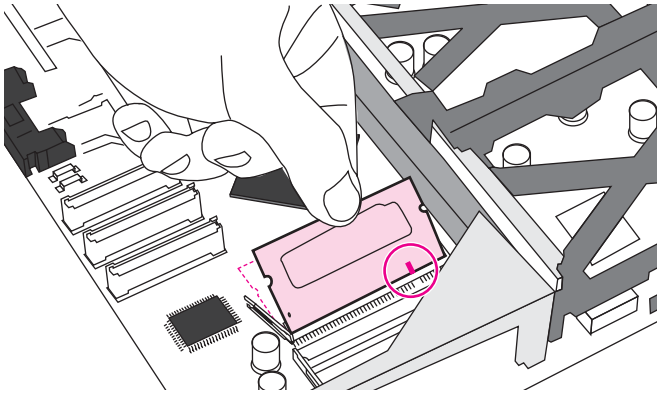
NOTE The HP CLJ 4610n only has one DDR DIMM memory slot.



7 Remove the new DIMM from the antistatic package. Locate the alignment notch on the bottom edge of the DIMM.

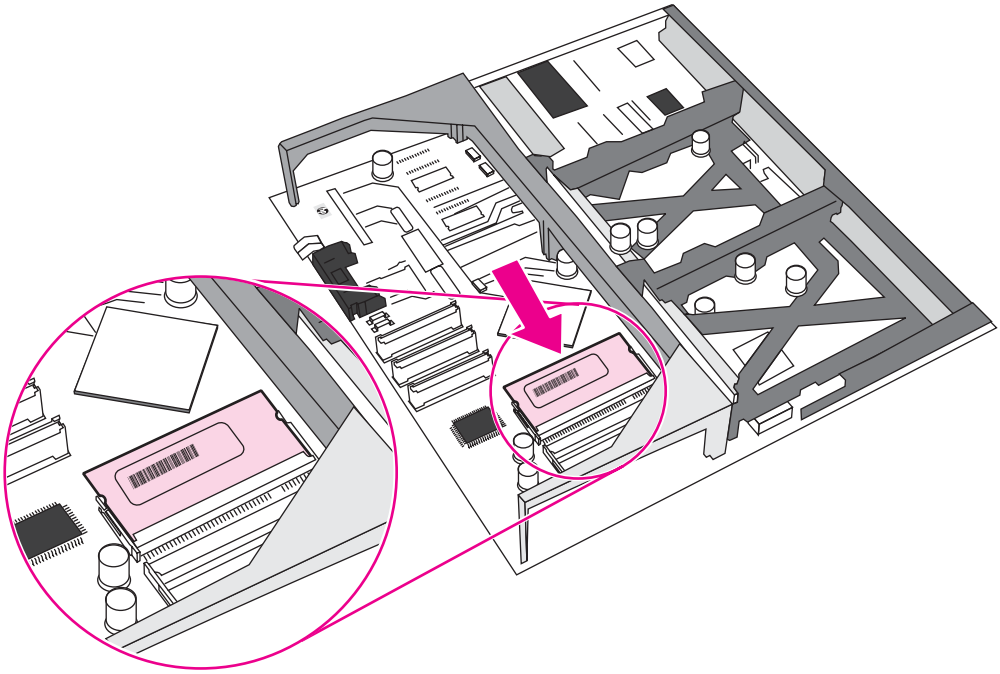


8 Holding the DIMM by the edges, align the notch on the DIMM with the bar in the DIMM slot at an angle and firmly press the DIMM into the slot until it is fully seated. When installed correctly, the metal contacts are not visible.



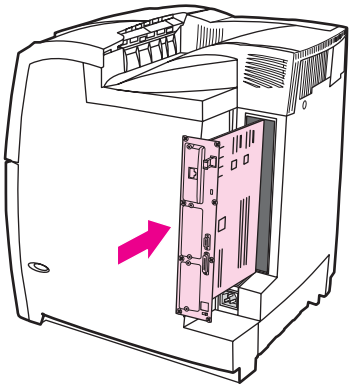
9 Push down on the DIMM until both latches engage the DIMM.

NOTE The HP CLJ 4610n only has one DDR DIMM memory slot.

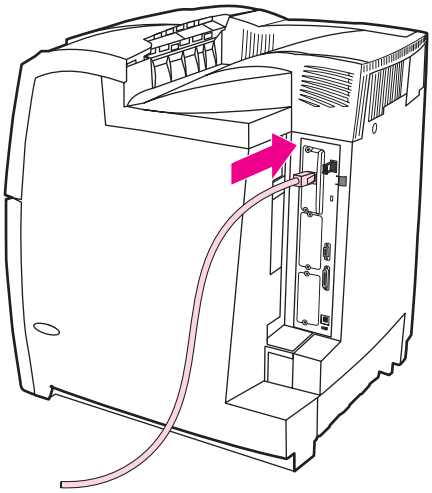


NOTE If you have difficulty inserting the DIMM, make sure that the notch on the bottom of the DIMM is aligned with the bar in the slot. If the DIMM still does not go in, make sure that you are using the correct type of DIMM.

10 Align the formatter board in the tracks at the top and bottom of the slot, and then slide the board back into the printer. Replace and tighten the eight screws removed in step 4.



11 Reconnect the power cable and interface cables, and turn the printer on.



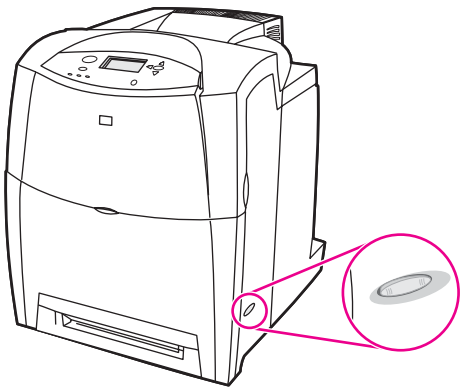
12 If you installed a memory DIMM, go to Enabling memory (HP Color LaserJet 4610n and 4650 models).

To install a flash memory card (HP Color LaserJet 4610n and 4650 models)

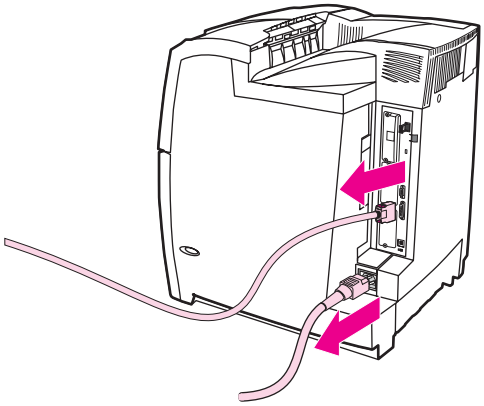
NOTE The back side of the HP CLJ 4650 model is shown in this procedure. The HP CLJ 4610n will appear slightly different, but the procedure for installing a flash memory card is the same for both models.

1 Turn the printer off.

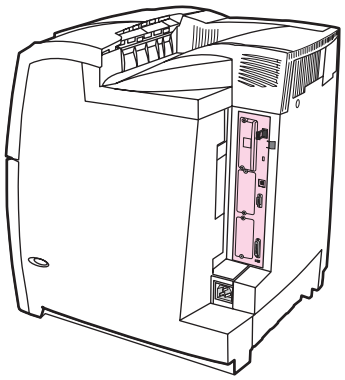
CAUTION Do not insert a flash memory card that is designed for use with a digital camera into the printer. The printer does not support photo printing directly from a flash memory card. If you install a camera-type flash memory card, a message appears on the control-panel display asking if you want to reformat the flash memory card. If you choose to reformat the card, all data on the card will be lost.



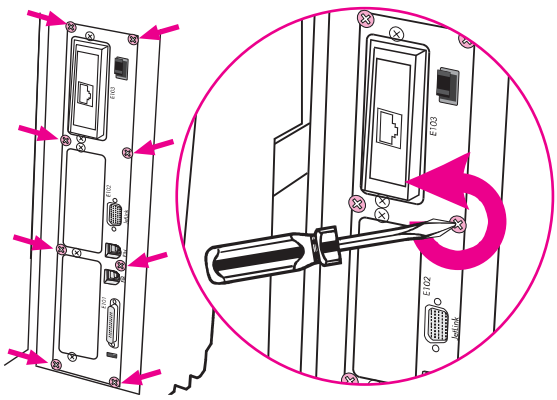
2 Disconnect all power and interface cables.



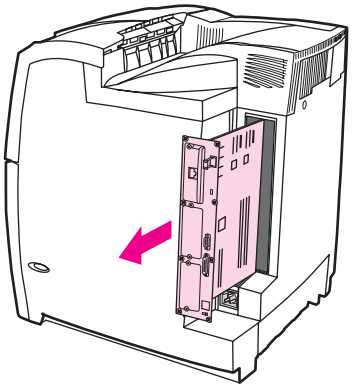
3 Locate the formatter board in the rear of the printer.



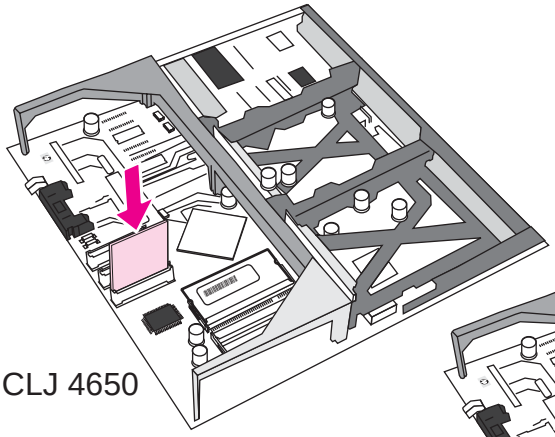
4 Using a #2 Phillips screwdriver, remove the eight screws holding the board in place, and set them aside.



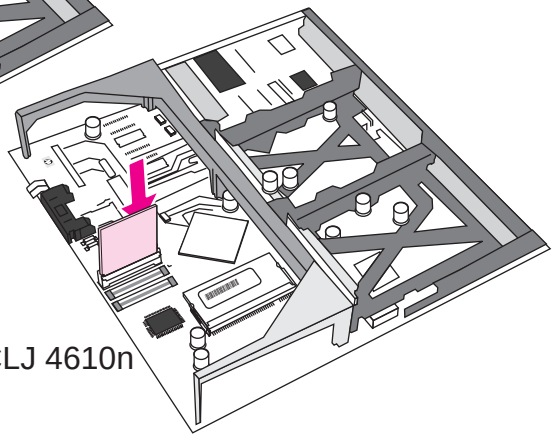
5 Slide out the formatter board and set it on a clean, flat, grounded surface.



6 Align the groove on the side of the flash memory card with the notches in the connector and push it in the slot until it is fully seated.



HP CLJ 4650

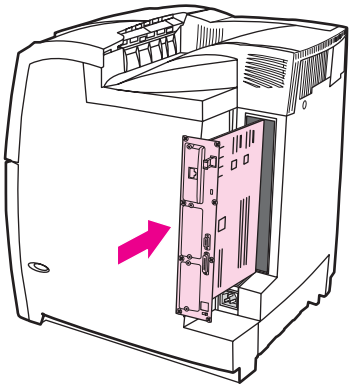


HP CLJ 4610n

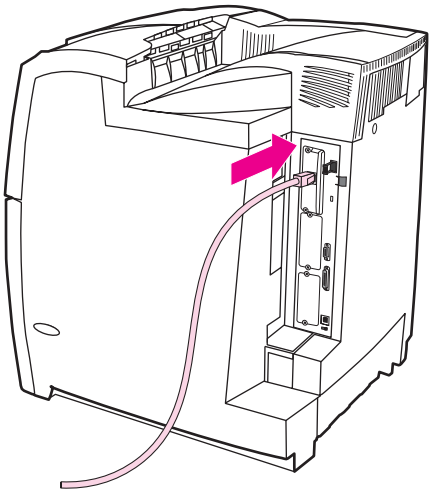
CAUTION Do not insert the flash memory card at an angle.

NOTE The first flash memory slot marked “Firmware Slot” is reserved for firmware only. On the HP Color LaserJet 4650 printer, slot 2 and slot 3 should be used for all other solutions. The CLJ 4601n only has one CompactFlash memory slot for firmware.

7 Align the formatter board in the tracks at the top and bottom of the slot, and then slide the board into the printer. Replace and tighten the eight screws that you removed in step 4.



8 Reconnect the power cable and interface cables, and turn the printer on.



Enabling memory (HP Color LaserJet 4610n and 4650 models)

If you installed a memory DIMM, set the printer driver to recognize the newly added memory.

To enable memory for Windows 98, ME, and NT (HP Color LaserJet 4650 models)

1. On the **Start** menu, point to **Settings**, and then click **Printers**.
2. Right-click the printer and select **Properties**.
3. On the **Configure** tab, click **More**.
4. In the **Total Memory** field, type or select the total amount of memory that is now installed.
5. Click **OK**.

To enable memory for Windows 2000 and XP (HP Color LaserJet 4610n and 4650 models)

1. On the **Start** menu, point to **Settings**, and then click **Printers** or **Printers and Faxes**.
2. Right-click the printer and select **Properties**.
3. On the **Device Settings** tab, click **Printer Memory** (in the **Installable Options** section).
4. Select the total amount of memory that is now installed, and then click **OK** .

Installing an HP Jetdirect print server card (HP Color LaserJet 4600 and 4650 models only)

You can install an HP Jetdirect print server card in the base model printer, which comes with an open EIO slot.

NOTE The HP Color LaserJet 4610n has no available EIO slots. This model uses the HP Jetdirect 175x print server, which is connected to the USB port. See Installing an HP Jetdirect print server card (HP Color LaserJet 4610n model).

1. Turn the printer off, and disconnect all power and interface cables.
2. Locate an empty EIO slot. Loosen and remove the two retaining screws holding the cover for the EIO slot onto the printer, and then remove the cover. You will not need these screws and cover again.

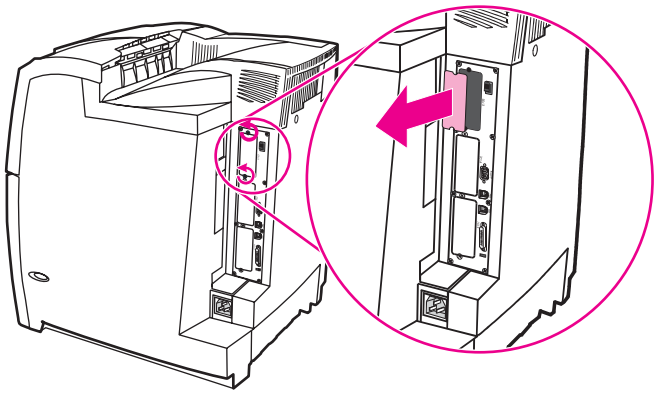


Figure 4-3 HP LaserJet 4600 models

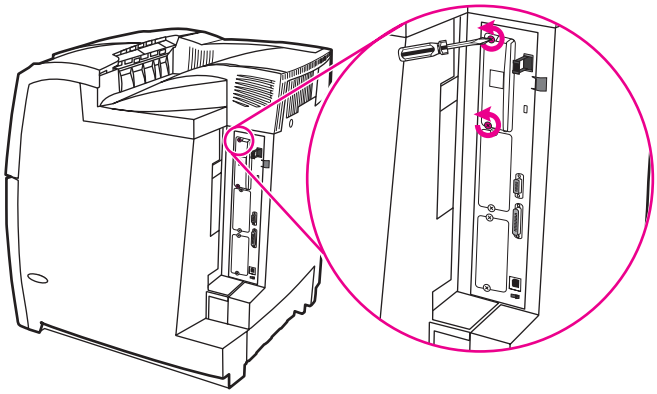


Figure 4-4 HP LaserJet 4650 models

3 Firmly insert the HP Jetdirect print server card into the EIO slot. Insert and tighten the retaining screws that came with the print server card.

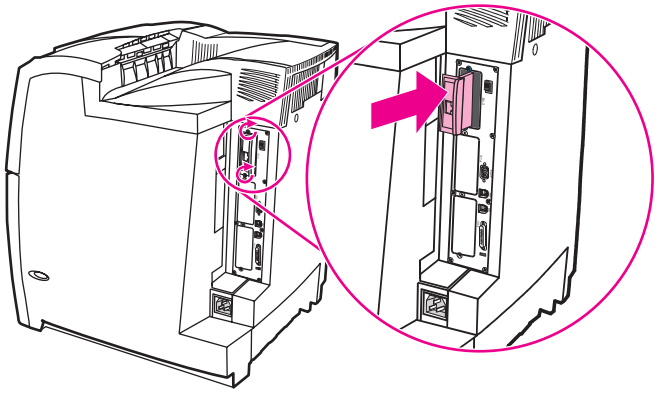


Figure 4-5 HP LaserJet 4600 models

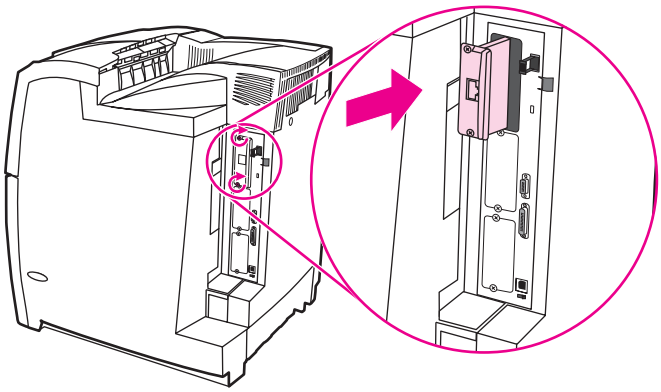


Figure 4-6 HP LaserJet 4650 models

4 Connect the network cable. Reconnect the power cable, and turn the printer on.

5 Print a configuration page. In addition to a printer configuration page, an HP Jetdirect configuration page that contains network configuration and status information should also print. If it does not print, uninstall and reinstall the print server card to ensure that it is completely seated in the slot.

6 Perform one of these steps:

- Select the correct port. See the computer or operating system documentation for instructions.
- Reinstall the software, and select the network installation.

Installing an HP Jetdirect print server card (HP Color LaserJet 4610n model)

The HP Color LaserJet 4610n printer comes standard with an HP Jetdirect 175x external print server that has to be installed in order to support multiple network protocols and operating systems.

When an HP Jetdirect print server is installed, a printer can be connected directly to a network at any location. HP Jetdirect print servers also support the Simple Network Management Protocol (SNMP), which provides network managers with remote printer management and troubleshooting through HP Web Jetadmin software

NOTE A network administrator should instal this external print server and configure the network. Configure the external print server through the HP Web Jetadmin software.

NOTE See the HP Jetdirect print server documentation for information about which external devices are supported.

5 Theory of operation

This chapter provides information about the following topics:

- Basic operation
- Engine-control system
- Laser/scanner assembly
- Image-formation system
- Pickup/feed system
- 500-sheet paper feeder
- 2 x 500-sheet feeder

Basic operation

The HP Color LaserJet 4600 Series printer functions are divided into four systems:

- Engine-control system
- Laser/scanner system
- Image-formation system
- Pickup/feed system

This chapter describes each of these systems thoroughly.

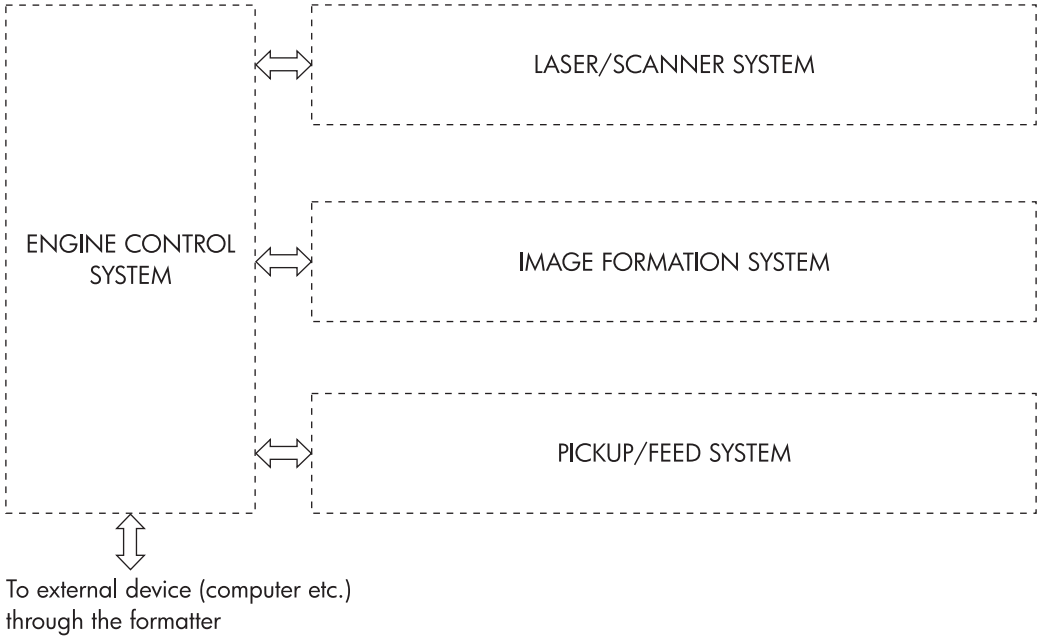


Figure 5-1 Basic system operation

Operation sequence

A microcomputer in the engine control system controls the operation sequence for the printer. The basic operation sequence (see Table 5-1 Basic operation sequence) describes the main operational periods from the point when the printer is turned on until a print operation is completed and each motor stops rotating.

NOTE In the following table, “ETB” stands for “electrostatic transfer/transport belt.”

Table 5-1 Basic operation sequence

Period		Purpose	Remark
WAIT (wait period)	From the time the power switch is turned on until the ETB cleaning is completed.	To clear a potential on the drum surface and to clean the ETB.	During this period, the printer checks the toner level and detects whether the cartridges are present. The printer also executes the pulse width modulation adjustment, color registration adjustment, and image density calibration control as required.
STBY (standby period)	From the end of the WAIT or LSTR period or last rotation until the formatter inputs a print command or until the power is turned off.	To keep the printer ready to print.	When the formatter sends a sleep command, the printer enters PowerSave mode.
INTR (initial rotations period)	From immediately after the formatter inputs a print command until the TOP signal is sent to the formatter.	To stabilize the photosensitive-drum sensitivity in preparation for a print operation.	
PRINT (print period)	From the end of the INTR period until the leading edge detection sensor detects paper and then turns off the transfer positive bias.	To form an image on the photosensitive drum according to the video signal input from the formatter and to transfer the toner image to the paper.	After the power is turned on, the cartridge is cleaned every 35 pages and the ETB is cleaned every 100 pages.
LSTR (last rotations period)	From the end of the PRINT period until the ETB motor stops.	To deliver the paper out of the printer and to clean the ETB.	The last rotations period lasts until the instant the formatter sends a print command. Then the initial rotations period starts again.

Engine-control system

The engine control system is the brain of the HP Color LaserJet 4600 Series printer. It controls all the other systems according to commands from the formatter. The engine control system consists of the following components:

- DC controller PCA
- Fuser power supply PCA
- High-voltage PCA
- Low-voltage power supply unit
- Formatter

Each of these components is described in this chapter.

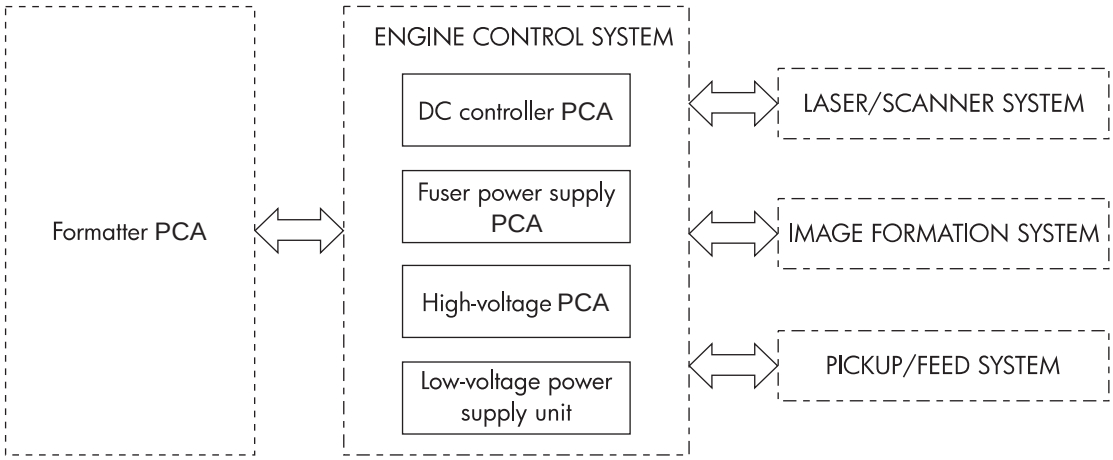


Figure 5-2 Engine control system

NOTE In this manual, the abbreviation "PCA" stands for "printed circuit board assembly." Components described as a PCA can consist of a single circuit board or a circuit board plus other parts, such as cables and sensors.

DC controller circuit

The DC controller controls the print operation sequence for the printer. The sequence of events is as follows:

1. Power is turned on, and then the low-voltage power supply unit supplies dc power to the DC controller.
2. The CPU in the DC controller starts to control printer operations, and The printer enters the standby period.
3. Based on the print command and the image data input from the formatter, the CPU sends a signal to drive the laser diode, the motors, and the solenoids.

NOTE See the general circuit diagram for detailed information about the printer circuitry.

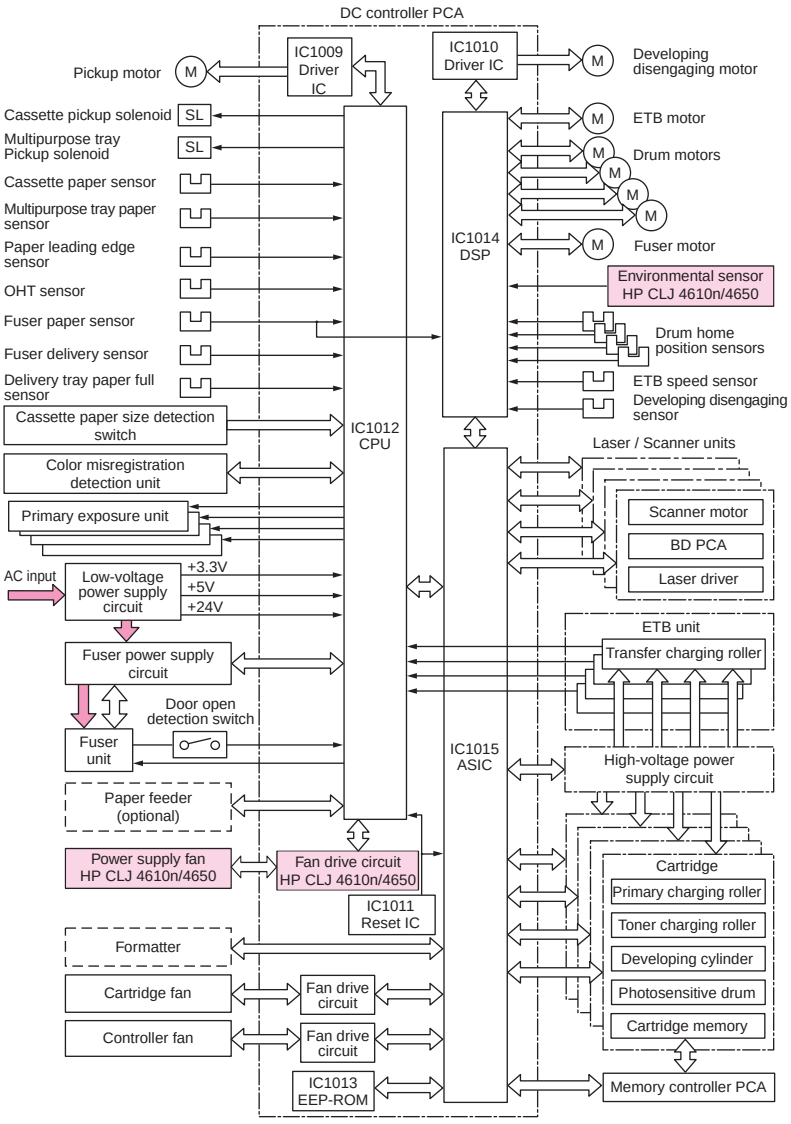


Figure 5-3 DC controller circuit

Motors, fans, and environment sensor

The printer has ten motors and two or three fans (HP Color LaserJet 4600 models have two fans; HP Color LaserJet 4650 models have three fans). HP Color LaserJet 4650 models also have one environment sensor. Eight of the motors are dc motors; the other two are stepping motors. Figure 5-4 Motors and fans (HP Color LaserJet 4600 Series printers) and Figure 5-5 Fan and environment sensor (HP Color LaserJet 4610n and 4650 models) shows the locations of the fan and sensor. Table 5-2 Function of motors, fans, and environment sensor explains the function of each component.

One of the stepping motors and six of the eight dc motors are used for paper feeding and image formation. The remaining stepping motor is the developing disengaging motor. The remaining two dc motors are fan motors.

Since the printer transfers an image in four colors in line onto the paper, small changes in the rotational speed of the motor are likely to cause color misalignment. The dc motors used for image formation are precisely controlled to account for rotational speed fluctuation.

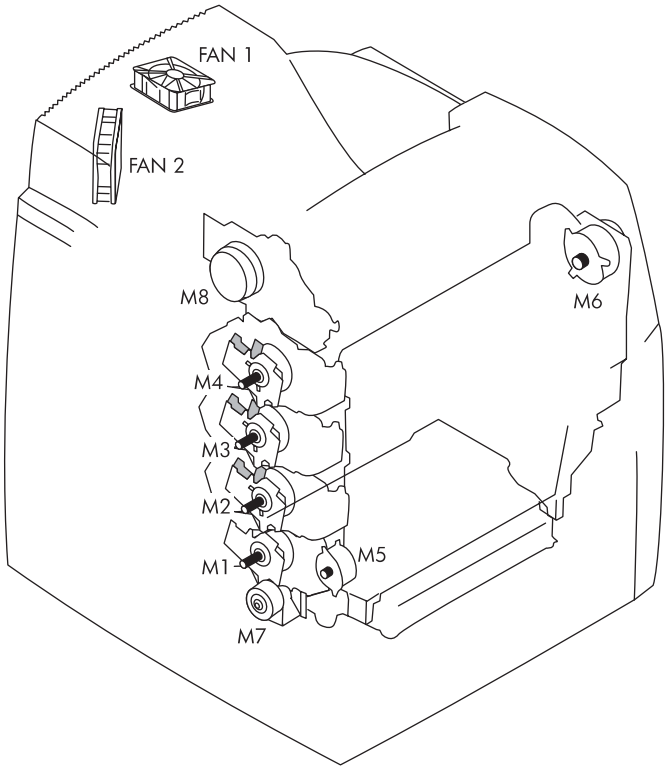


Figure 5-4 Motors and fans (HP Color LaserJet 4600 Series printers)

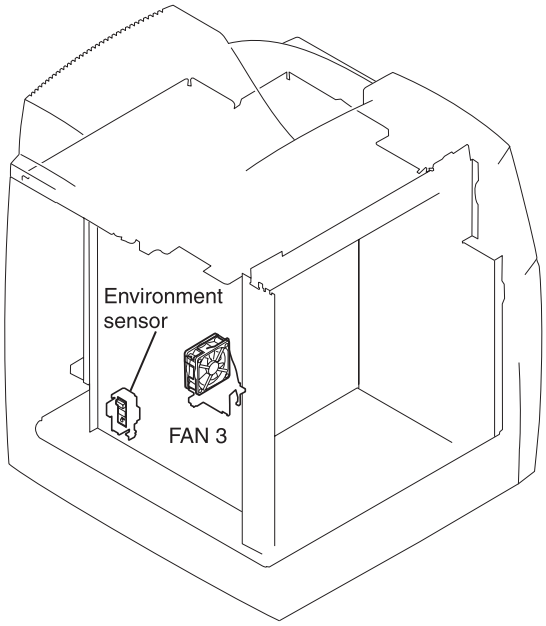


Figure 5-5 Fan and environment sensor (HP Color LaserJet 4610n and 4650 models)

Table 5-2 Function of motors, fans, and environment sensor

Name	Function	Type	Speed switching
M1: Cyan cartridge motor	Drives the photosensitive drum	dc motor	4-speed (full, 1/2, 1/3, 1/4)
M2: Yellow cartridge motor			
M3: Magenta cartridge motor			
M4: Black cartridge motor			
M5: Pickup motor	Drives the pickup roller and feed roller	Stepping motor	4-speed (full, 1/2, 1/3, 1/4)
M6: ETB motor	Drives the ETB	dc motor	4-speed (full, 1/2, 1/3, 1/4)
M7: Developing disengaging motor	Separates the photosensitive drums and the developing cylinders	Stepping motor	No
M8: Fuser motor	Drives the pressure roller and delivery roller	dc motor	4-speed (full, 1/2, 1/3, 1/4)
FAN1: Formatter fan	Exhausts heat around the formatter and low-voltage power supply unit	dc motor	2-speed (full during printing, 1/2 during standby)
FAN2: Cartridge fan	Exhausts heat around the fuser and cartridges	dc motor	No (full speed during printing only)

Table 5-2 Function of motors, fans, and environment sensor (continued)

Name	Function	Type	Speed switching
FAN 3: Power-supply fan (HP Color LaserJet 4610n and 4650 models only)	Exhausts heat around the pickup motor and low-voltage power supply	dc motor	No (full speed during printing only)
Environment sensor (HP Color LaserJet 4610n and 4650 models only)	Detects the temperature and humidity levels inside the printer	NA	NA

Fuser power-supply circuit

This printer uses an induction heating method to heat the fuser. Figure 5-6 Fuser power-supply circuit shows the configuration of the fuser power supply.

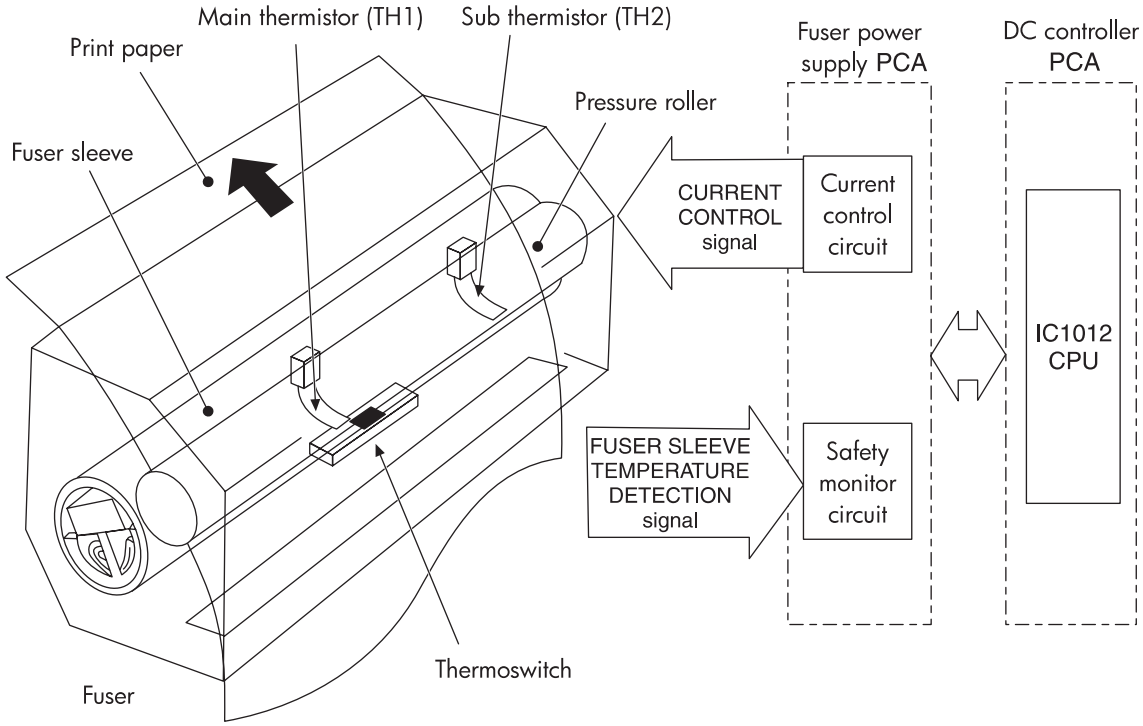


Figure 5-6 Fuser power-supply circuit

The fuser power supply has three main components:

- **Fuser sleeve.** A high-frequency current flows through an induction heating coil in the fuser sleeve, causing the metal sleeve to heat.
- **Thermistors.** Two thermistors are in the fuser sleeve: one in the center, and the other at the end. Each thermistor monitors the temperature in the fuser sleeve.
- **Thermoswitch.** The thermoswitch is located at the bottom center of the fuser sleeve. When the fuser is overheating, the switch opens, and power to the induction heating coil is shut off.

Table 5-3 Fuser temperatures

Media	Temperature	Engine speed
Plain	~ 190°C (374°F)	Full speed
Overhead transparencies	~ 172°C (342°F) color	1/4 speed
	~ 185°C (365°F) monochrome	1/2 speed
Thick	~ 185°C (365°F)	1/2 speed
Gloss	~ 167°C (333°F)	1/3 speed
Envelopes	~ 190°C (374°F)	Full speed

Heater temperature control

The heater temperature control detects the surface temperature of the fuser sleeve and controls the current flowing to the induction heating coil. The heater temperature control circuit is shown in Figure 5-7 Heater temperature control circuit.

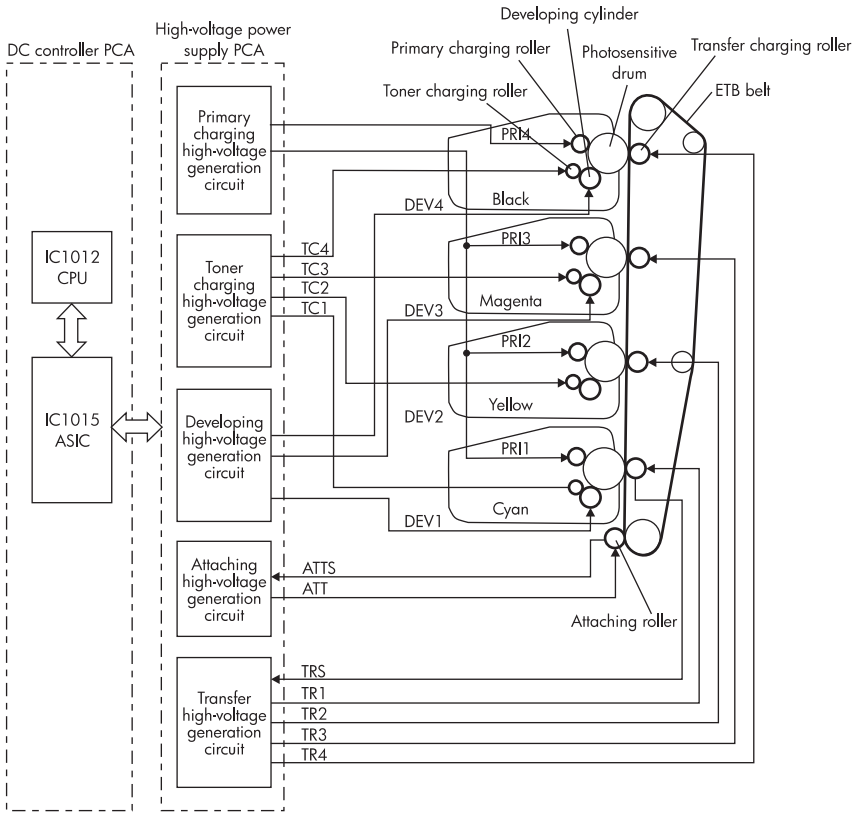


Figure 5-7 Heater temperature control circuit

The two thermistors that are attached to the fuser sleeve (TH1 and TH2) detect the surface temperature of the fuser sleeve. The main thermistor (TH1) controls the fuser temperature, and the sub thermistor (TH2) detects overheating at the end of the fuser sleeve. When the surface temperature of the fuser sleeve increases, resistance of the two thermistors is reduced, and the voltage of the main thermistor detection signal (MAINTH1) and the sub thermistor detection signal (SUBTH1) drops.

The CPU (IC1012) on the DC controller monitors the voltage of the MAINTH1 and SUBTH1 signals. The CPU sends the fuser temperature control signal (TMPCON) according to the voltage level.

The CPU sends the amperage control signal (PRANGE) to control the amperage of the fuser sleeve.

NOTE **HP Color LaserJet 4610n and 4650 models**: During standby, the fuser temperature is maintained at about 170°F (76.7°C) to accommodate a first-print time of less than 15 seconds.

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High-voltage power supply

The high-voltage power supply circuit applies bias to the primary charging rollers, the toner charging rollers, the developing cylinders, the attaching roller, and the transfer charging rollers. Figure 5-8 High-voltage power supply circuit shows the high-voltage power supply circuit.

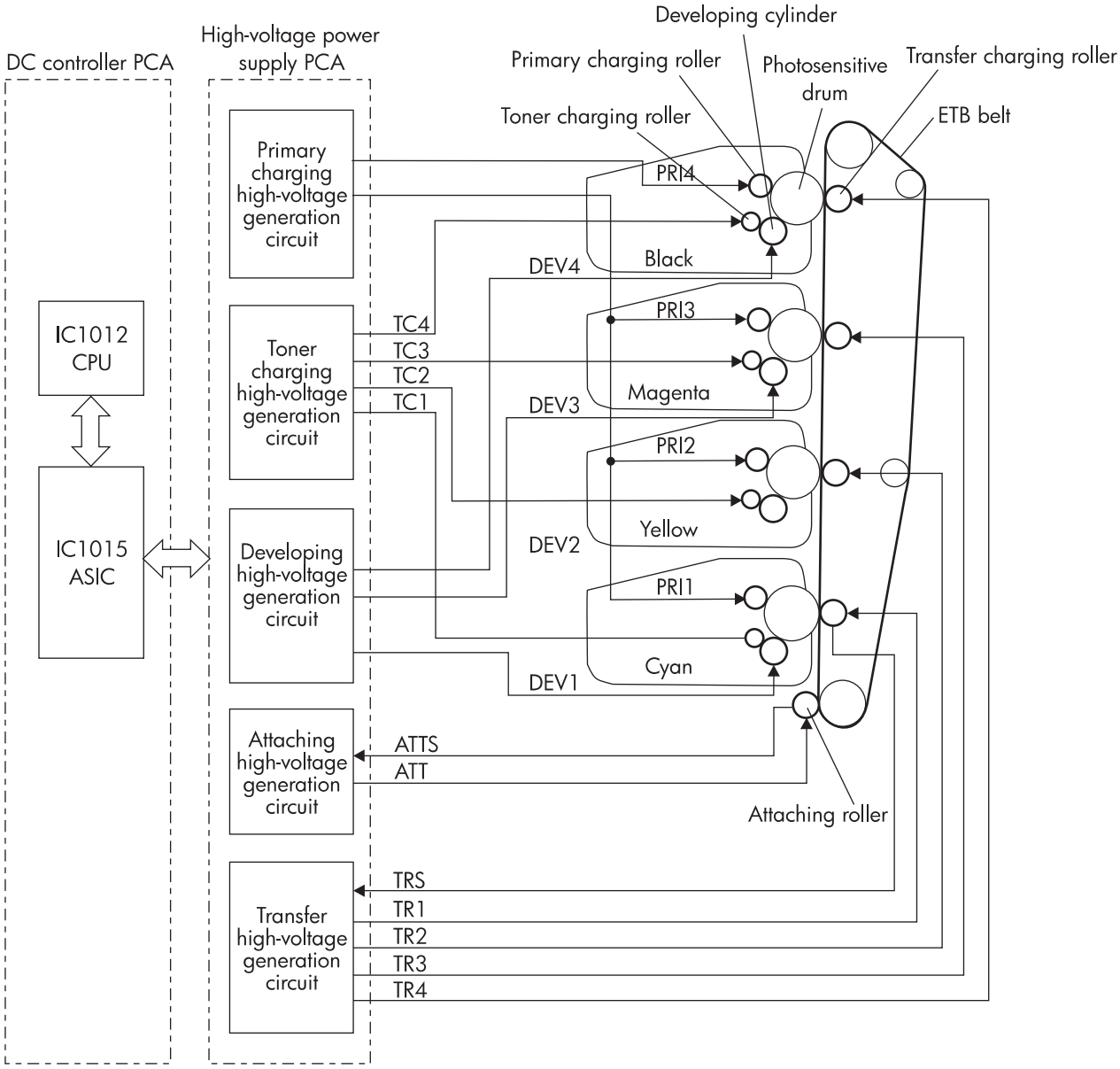


Figure 5-8 High-voltage power supply circuit

Low-voltage power supply

The low-voltage power supply circuit converts the ac voltage that is input from the electrical outlet to dc power and delivers it to each load in the printer. Figure 5-9 Low-voltage power supply circuit shows the low-voltage power supply circuit including the amount of voltage supplied to each component.

The ac power is supplied to the low-voltage power supply by turning on the power supply switch (SW5). The ac power is converted to the dc power that the printer requires:

- +24 V goes to the motors, solenoids, clutches, and the high-voltage power supply circuit.
- +5 V goes to the laser driver PCA, the beam detect PCA, and the formatter.
- +3.3 V goes to the formatter, the sensors, and the ICs in the DC controller PCA.

+24 V is divided into +24 VA, which is constantly sent from the low-voltage power supply circuit, and +24 VB, which stops power supply when the top cover or the front cover is opened. +24 VB goes to the fuser power-supply circuit, high-voltage power-supply circuit, and the motors and solenoids. +24 VB also functions as the door-open (/DOPEN) detection signal. The CPU detects the door open with the signal.

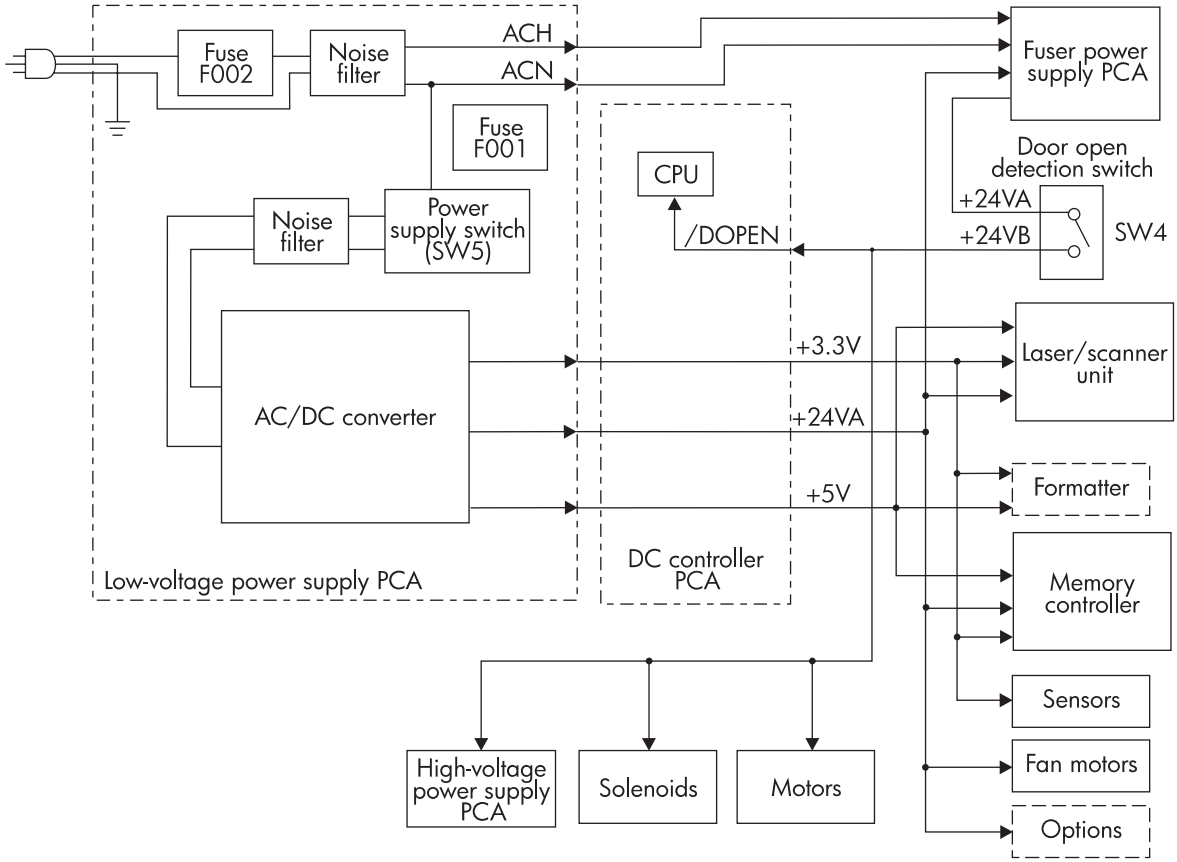


Figure 5-9 Low-voltage power supply circuit

Formatter system

The formatter PCA is responsible for the following actions:

- Receiving and processing print data from the various printer interfaces
- Monitoring control panel inputs and relaying printer status information (through the control panel and the bidirectional I/O)
- Developing and coordinating data placement and timing with the print engine
- Storing font information
- Communicating with the host computer through the bidirectional interface
- Controlling the PowerSave mode

The formatter monitors the printer continuously through the video interface. When the printer is ready to print, the formatter sends a signal to the DC controller, which turns the laser on or off based on the signal. Figure 5-10 Formatter system shows the formatter system.

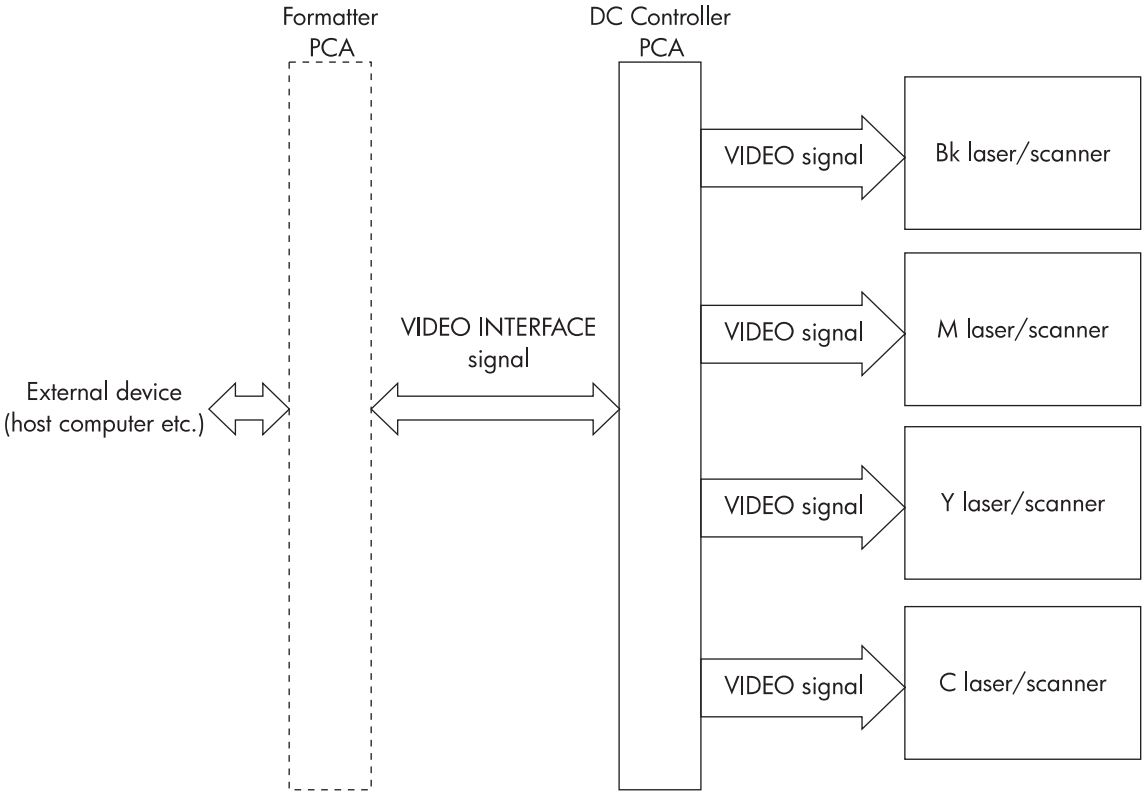


Figure 5-10 Formatter system

PowerSave

This feature conserves power after the printer has been idle for an adjustable length of time. Set the time length in the **Configure Device** menu, under **System Setup**. When the printer is in PowerSave mode, the control-panel backlight is turned off, but the printer retains all printer settings, downloadable fonts, and macros. The default setting is **POWERSAVE= ON**, with a 30-minute idle time. You can turn **PowerSave** off in the **Configure Device** menu, under Resets.

The printer exits PowerSave mode and enters the warm-up cycle when any of the following occurs:

- A print job, valid data, or a PML or PJL command is received at the parallel port, FIR port (HP CLJ 4600 models), EIO card (HP CLJ 4600 and 4650 models only), or 1.1 USB connector (HP CLJ 4610n and 4650 models).
- A control-panel button is pressed
- The top cover is opened
- A paper tray is opened
- The engine-test button is pressed

NOTE Printer error messages override the PowerSave message. The printer enters PowerSave mode at the appropriate time, but the error message continues to appear.

Input/output

This section explains the printer input/output (I/O) capabilities.

Parallel interface

The formatter receives incoming data through its bidirectional interface (IEEE-1284). The I/O provides high-speed and two-way communication between the printer and the host, allowing the user to change printer settings and monitor printer status from the host computer. The user can configure the HIGH SPEED item on the control panel menu. (This item is found by navigating to the **Configure Device** menu, in the **I/O** menu, and **Parallel Input**.) The default setting, **Yes**, allows the I/O to run at the higher speeds supported by most newer computers. When set to **No**, the parallel interface runs at the slower mode that is compatible with older computers. The user can also configure the **Advance Functions** item. The default setting, ON, allows for two-way parallel communications. The **Off** mode disables the advanced functionality. The I/O is compatible with the bidirectional parallel interface standard.

Expanded I/O (HP Color LaserJet 4600 models)

The optional HP Fast InfraRed receiver enables wireless printing from any IRDA-compliant portable device (such as a laptop computer) to the printer.

The printing connection is maintained by positioning the sending infrared port within operating range. The connection can be blocked by objects such as a hand or paper, or by direct sunlight or any bright light shining into either infrared port.

USB 1.1 connector (HP Color LaserJet 4610n and 4650 models)

The HP Color LaserJet 4650 models supports a USB 1.1 connector on the back of the printer. You must use an A-to-B type USB cable.

Flash (HP Color LaserJet 4600 models)

Optional flash is available in 4 MB flash memory DIMMs for storing forms, fonts, and signatures.

Hard-disk accessory (HP Color LaserJet 4600 and 4650 models)

The optional hard-disk accessory can be mounted in one of the EIO slots on the rear of the formatter. The optional EIO-based hard disk is used for creating multiple original prints (mopies) and storing forms, fonts, and signatures.

CPU

The HP LaserJet 4600 models formatter incorporates a 400 MHz RISC processor. The formatter for the HP LaserJet 4610n and 4650 models incorporates a 533 MHz RISC processor.

Printer memory

If the printer encounters difficulty managing available memory, a clearable warning message will appear on the control panel.

Some printer messages are affected by the auto-continue and clearable warning settings from the **Configure Device** menu, under **System Setup**. If **Clearable Warning = Job** is set on the control panel, warning messages appear on the control-panel display until the end of the job from which they were generated. If **Clearable Warning = On** is set, warning messages appear on the control panel until ✓ (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models) is pressed. If an error occurs that prevents printing and **Auto Continue = Off** is set, the message appears until ✓ (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models) is pressed.

Read-only memory

Besides storing microprocessor control programs, the read-only memory (ROM) stores dot patterns of internal character sets (fonts).

Random-access memory

The random-access memory (RAM) contains the page, I/O buffers, and the font storage area. It stores printing and font information received from the host system, and can also serve to temporarily store a full page of print-image data before the data is sent to the print engine. Memory capacity can be increased by adding DIMMs to the formatter. Note that adding memory (DIMMs) might also increase the print speed for complex graphics.

DIMM slots (HP Color LaserJet 4600 Series printer)

The DIMM slots can be used to add memory, fonts, or firmware upgrades.

Firmware DIMM (HP Color LaserJet 4600 models)

To upgrade printer firmware, install a new firmware DIMM (firmware DIMMs are flashable). See Installing memory and font DIMMs (HP Color LaserJet 4600 models) for more information.

Flash memory (HP Color LaserJet 4610n and 4650 models)

To upgrade printer firmware, install a new firmware Compact FLASH. See Installing memory (HP Color LaserJet 4610n and 4650 models) and fonts (HP Color LaserJet 4650 models) for more information.

Nonvolatile memory

The printer uses nonvolatile memory (NVRAM) to store I/O and information about the print environment configuration. The contents of NVRAM are retained when the printer is turned off or disconnected.

PJL overview

Printer job language (PJL) is an integral part of configuration, in addition to the standard printer command language (PCL). With standard cabling, PJL allows the printer to perform functions such as the following:

- Two-way communication with the host computer through a bidirectional parallel connection. The printer can tell the host about such things as the control-panel settings, and the control-panel settings can be changed from the host.
- Dynamic I/O switching allows the printer to be configured with a host on each I/O. The printer can receive data from more than one I/O simultaneously, until the I/O buffer is full. This can occur even when the printer is offline.
- Context-sensitive switching allows the printer to automatically recognize the personality (PS or PCL) of each job and configure itself to serve that personality.
- Isolation of print environment settings from one print job to the next. For example, if a print job is sent to the printer in landscape mode, the subsequent print jobs print in landscape only if they are formatted for landscape printing.

PML

The printer management language (PML) allows remote configuration and status readback through the I/O ports.

Control panel

The formatter sends and receives printer status and command data to and from a control panel board.

Laser/scanner assembly

The laser/scanner system receives a signal from the formatter and forms a latent image on the photosensitive drum in the print cartridge. The printer has a separate laser/scanner unit for each color. Each of these has the same structure, which is shown in Figure 5-11 Laser/scanner system.

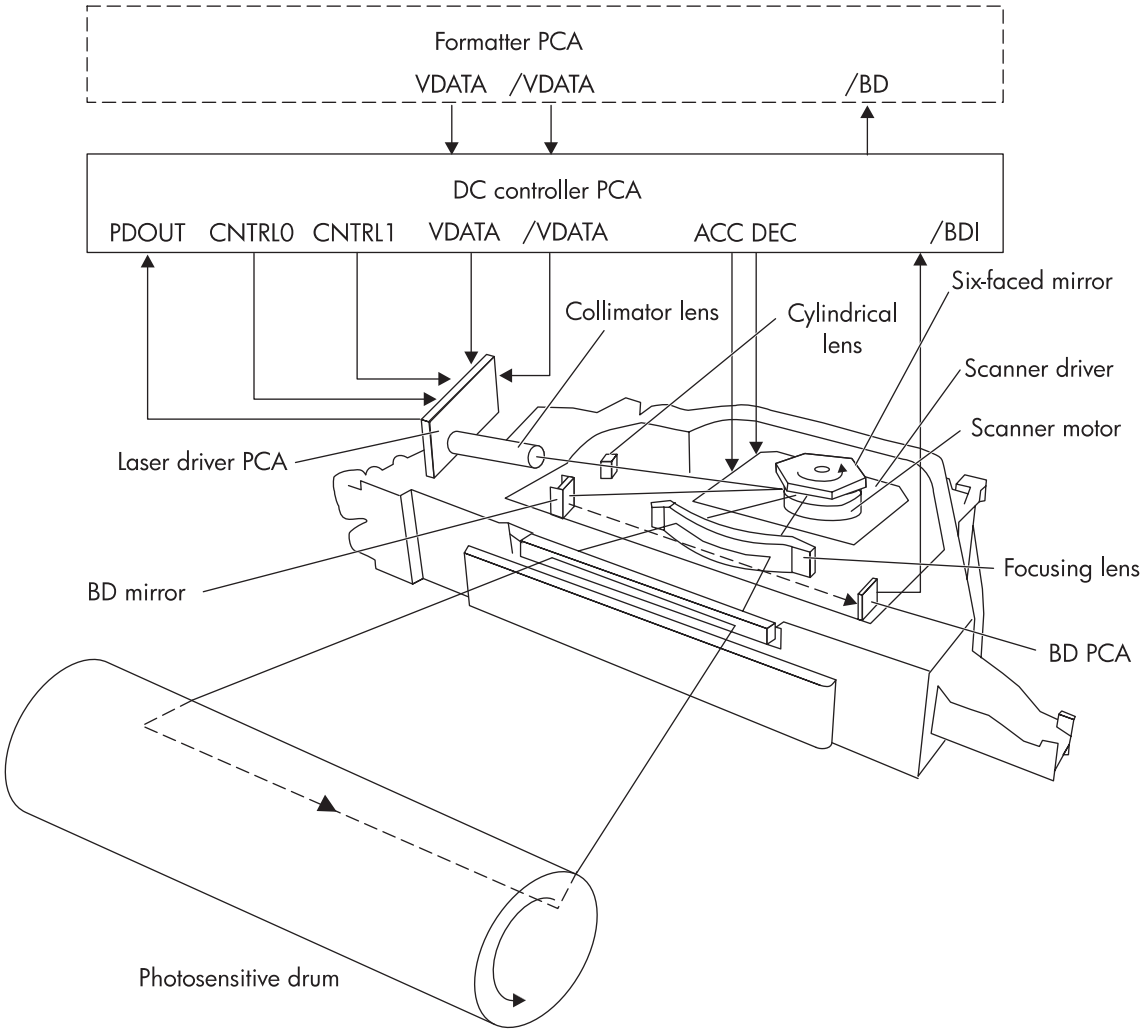


Figure 5-11 Laser/scanner system

Scanner-motor control

The scanner-motor control rotates the scanner motor in order to place the laser beam at the correct position on the photosensitive drum. Figure 5-12 Scanner-motor control circuit shows the circuit diagram for the scanner-motor control.

NOTE If a scanner-motor error occurs, the print engine stops and an error message appears on the control-panel display.

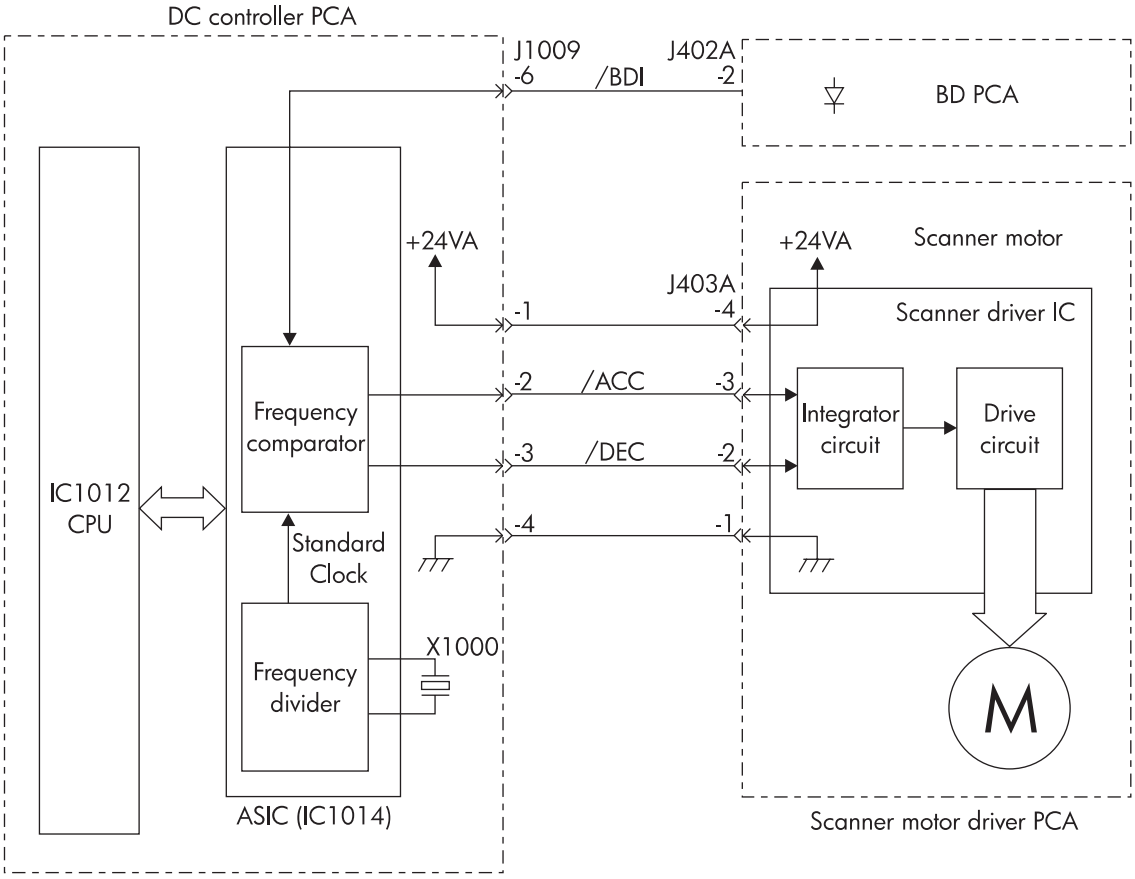


Figure 5-12 Scanner-motor control circuit

Image-formation system

The image-formation system is the central hub of the printer. Figure 5-13 Image-formation system shows the image-formation system. During image formation, an image of colored toner is formed and then fused onto the paper. The image-formation system consists of the following components:

- Four laser/scanners
- Four print cartridges
- ETB
- Fuser

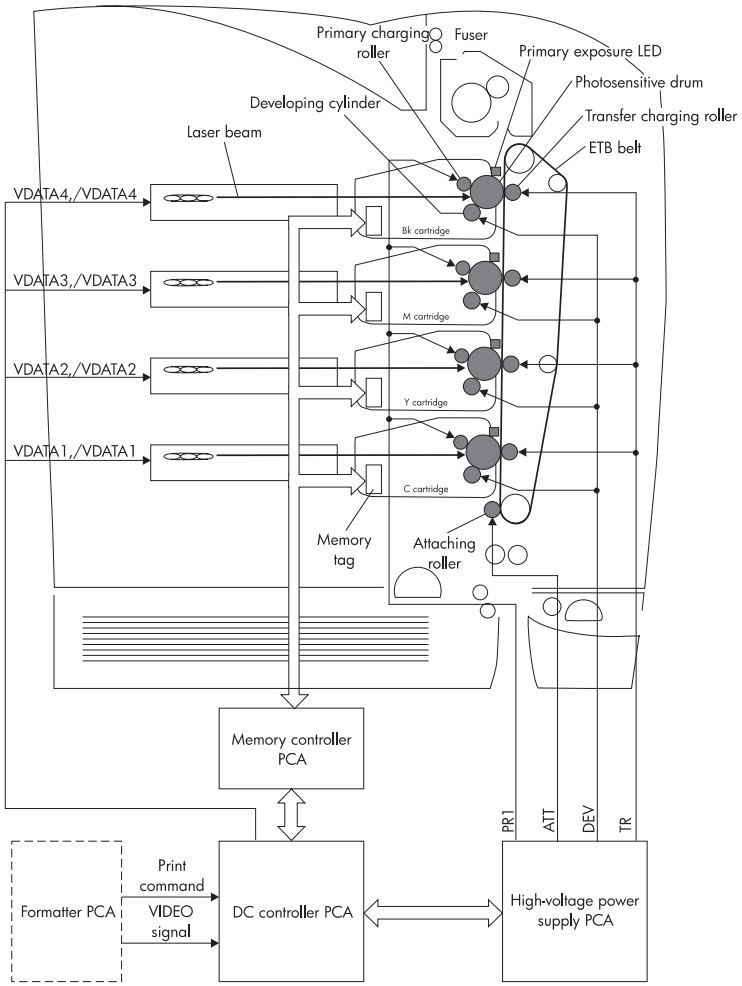


Figure 5-13 Image-formation system

Image-formation process

The image-formation process consists of eleven steps divided among five functional blocks:

- Electrostatic latent-image formation block
- Developing block
- Transfer block
- Fusing block
- Cleaning block

Figure 5-14 Image-formation process illustrates the overall image-formation process. The image-formation process steps are numbered from start to finish. The following sections in this chapter describe the five functional blocks in the image-formation process.

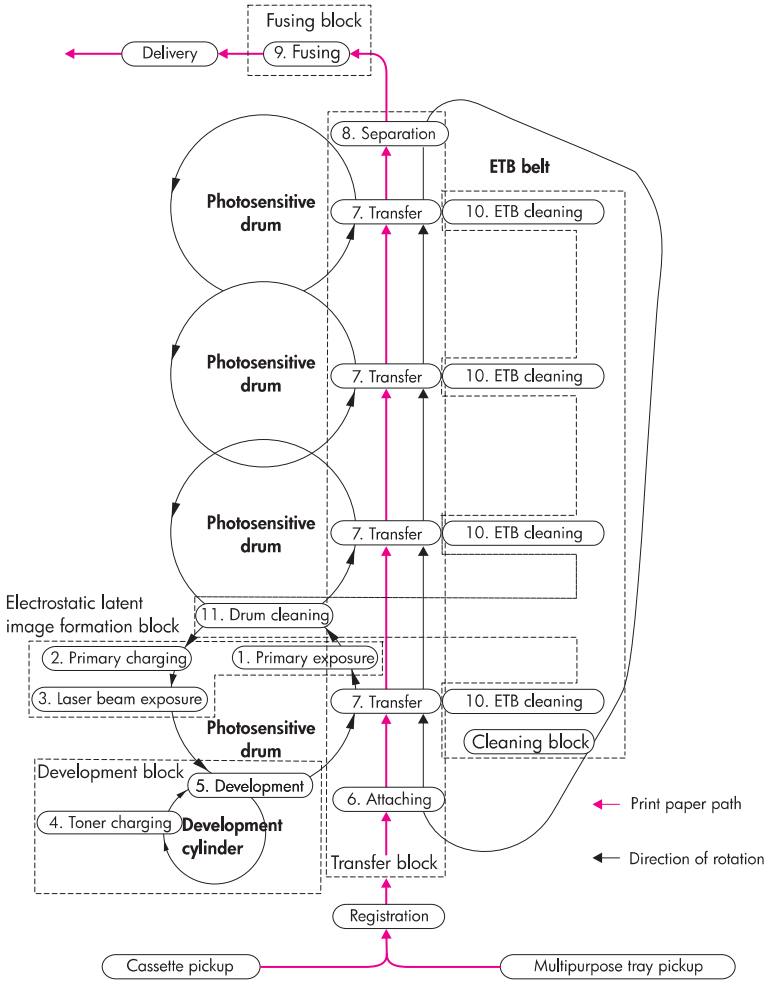


Figure 5-14 Image-formation process

Print cartridges

The printer has four different print cartridges, one for each color. However, they share the same structure, shown in Figure 5-15 Print cartridge.

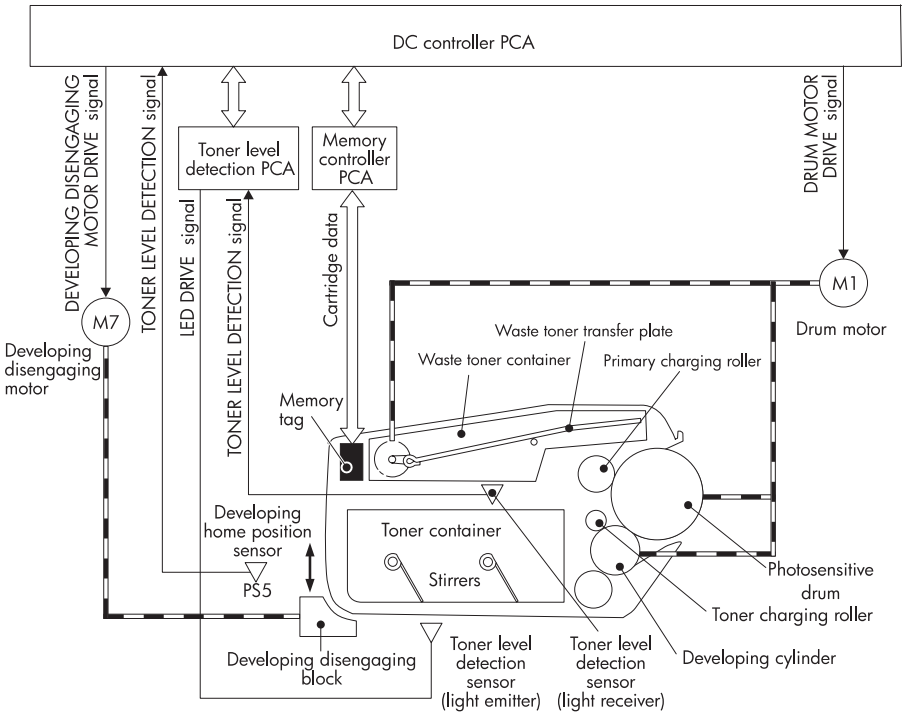


Figure 5-15 Print cartridge

The following are the physical components inside the print cartridge:

- Photosensitive drum
- Primary charging roller
- Developing cylinder
- Toner charging roller
- Stirrers
- Waste-toner transfer plate

The photosensitive drum rotation drives the primary charging roller. All other components are driven by the drum motor.

The developing disengaging motor drives the developing disengaging block, which causes the developing cylinder to engage with or disengage from the photosensitive drum.

The DC controller uses an LED and a photo diode to monitor the level of toner inside the cartridge. It stores this information on a memory tag that is built into each cartridge.

Memory tag

The memory tag is an EEP-ROM that is built into the print cartridge. It stores information about the amount of toner in the cartridge and estimates the remaining life. Figure 5-16 Memory tag illustrates how the memory tag operates.

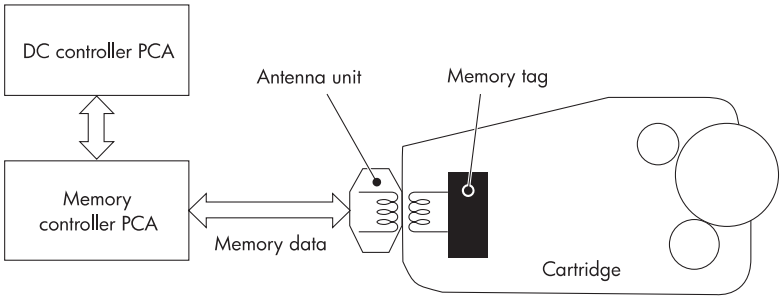


Figure 5-16 Memory tag

The DC controller reads information from the memory tag whenever the printer is turned on, whenever the top cover is closed, and whenever it receives a READ command from the formatter.

The DC controller writes information to the memory tag at specified times during a print operation and whenever it receives a WRITE command from the formatter.

If the DC controller is unable to either read to or write from the memory tag four times in a row, the DC controller alerts the formatter of a memory tag abnormality.

Toner-level detection

The printer monitors print-cartridge life in several ways to ensure continued high print quality:

- The number of developer rotations measures the usefulness (charge) of the toner.
- The toner sensor monitors remaining toner, and informs the user of toner "low" or "out" conditions.
- The number of photosensitive drum rotations measures the life of the photosensitive drum, which degrades slightly with each rotation.

The cartridge life, represented on the supplies status page and in the gauges on the control panel, is a combination of all three of these components. The lowest remaining percent is the number reported to the customer. However, information about which of these components is low or out is not reported.

During the life of a print cartridge, the customer receives three different control panel messages:

- **OK**. The cartridge has between 15% and 100% life remaining.
- **Order cartridge**. The cartridge has 15% life remaining. In typical printing situations, this represents about 2 weeks of use.
- **Replace cartridge**. One of the three components listed above has reached its end of life. The printer stops, and printing cannot continue until the cartridge is replaced.

Developer rotations

The developer-roller rotations are tracked on the print cartridge memory tag (e-label). Tracking rotations enables the printer to signal that a print cartridge is low or out before the developer or toner is actually worn out, which would result in print-quality defects.

Over time, the toner loses its required properties as a result of excessive stirring and recharging. Although the cartridge will correctly signal LOW or OUT because of wear, some toner might remain in the fresh-toner hopper.

In addition to toner wear, the developer roller wears during use, so developer-life tracking is necessary. In situations where low-coverage documents are printed frequently, the developer rotations might cause a LOW signal before the toner level reaches its low level.

Toner sensor

For the first 75% of the cartridge life, toner depletion within the cartridge is calculated by counting pixels. An optical toner-level sensor then tracks the final 25% of toner. The toner is measured and then reported on the toner gas gauge on the control panel or on the supplies status page. The transition from counting pixels to optical toner-level sensing causes no fluctuations on the toner gauge. Some toner might remain in the fresh-toner hopper although other cartridge components have reached their end of life.

Photosensitive drum rotations

Photosensitive drum rotations are also tracked on the cartridge memory tag. Similar to the process for the developer roller, tracking these rotations enables the printer to signal that a print cartridge is low or out before the photosensitive drum is actually worn out, when print quality defects would occur. Wear on the photosensitive drum might cause a low message when low-coverage documents are printed frequently. Tracking of drum life is essential because of drum wear and the potential for overflow from the waste-toner hopper if use of the photosensitive drum is overextended.

Figure 5-17 Toner-level detection illustrates the toner-level detection system.

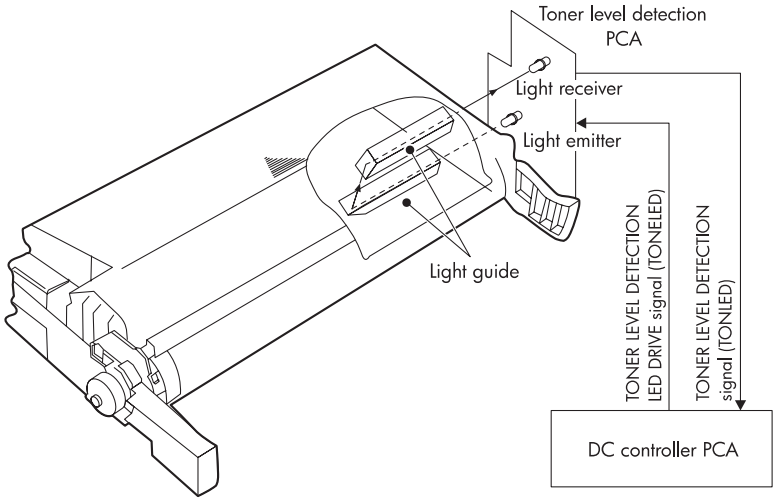


Figure 5-17 Toner-level detection

Developing cylinder disengaging control

Whenever the developing cylinder is in contact with the photosensitive drum, toner passes onto the drum. At certain times, such as during ETB cleaning or during monochrome printing, toner should not pass onto the drum, and the developing cylinder should not be in contact with the drum. The bottom half of the print cartridge can pivot up and down, causing the developing cylinder to either come in contact with or move away from the photosensitive drum. A small block inside the printer causes each cartridge to pivot. When the block is pushed up, the rear of the cartridge is pushed up, and the front of the cartridge swings down. The developing cylinder disengages from the drum. Figure 5-18 Developing cylinder disengaging illustrates this process.

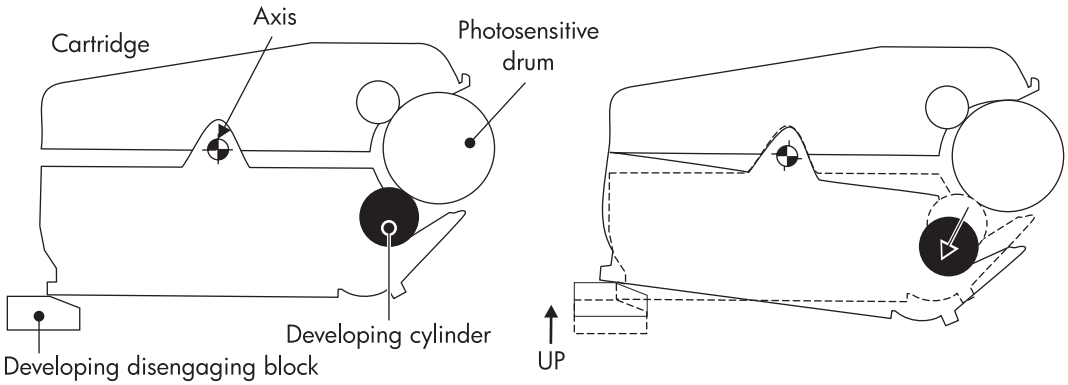


Figure 5-18 Developing cylinder disengaging

The developing cylinders are disengaged only during monochrome printing or during ETB cleaning. During monochrome printing, the developing cylinder in all cartridges (except the black cartridge) is disengaged. During ETB cleaning, the developing cylinders in all cartridges are disengaged.

Electrostatic transfer/transport belt (ETB) unit

The ETB unit feeds the media through the printer and helps transfer toner onto the media. Figure 5-19 ETB unit illustrates the ETB unit.

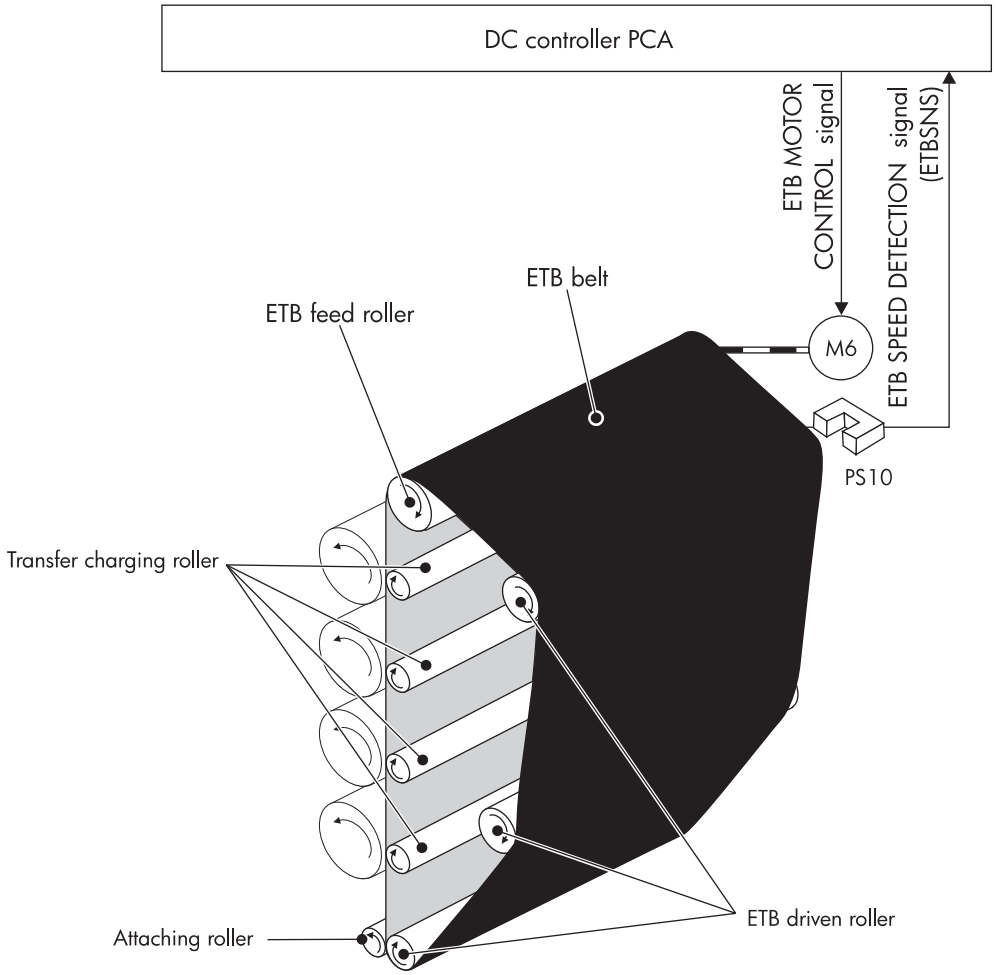


Figure 5-19 ETB unit

The following are the components of the ETB unit:

- ETB belt
- ETB feed roller
- Attaching roller
- Transfer charging rollers (four)
- ETB-driven rollers (three)

The ETB motor drives the ETB feed roller, causing the belt to rotate. All other rollers are driven by the belt rotation.

A sensor at the top of the ETB unit detects its speed. The DC controller maintains a constant ETB feed speed to ensure good color registration.

Electrostatic-latent-image-formation block

The image formation process begins in the electrostatic-image formation block (see Figure 5-14 Image-formation process), where the electrostatic latent image is formed on the photosensitive drum. This block consists of three steps:

- Primary exposure
- Primary charging
- Laser-beam exposure

After the last step is complete, areas of the drum surface that have not been exposed to the laser beam retain a negative charge. The areas that have been exposed to the laser are neutralized. This neutralized image is called an electrostatic latent image because it is invisible to the eye.

Step 1: Primary exposure

To prepare for primary charging, light from the primary exposure LED strikes the photosensitive drum surface. This eliminates any residual charge on the drum surface in order to avoid inconsistent charge density. Figure 5-20 Primary exposure illustrates this step.

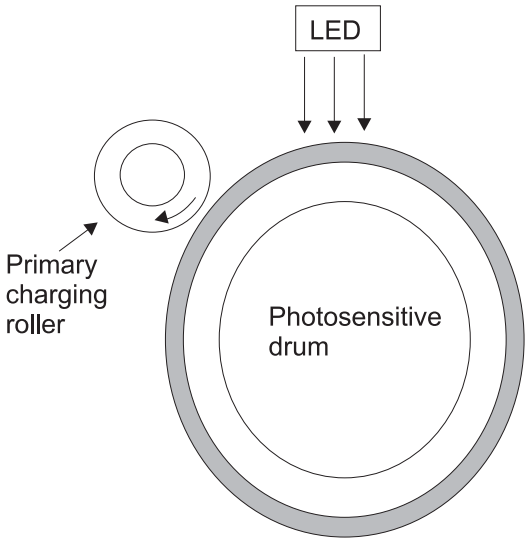


Figure 5-20 Primary exposure

Step 2: Primary charging

To prepare for latent-image formation, a uniform negative potential is applied to the photosensitive drum surface. The primary charging roller is made of a conductive rubber. A dc bias is applied to the primary charging roller to maintain uniform potential on the drum surface. Figure 5-21 Primary charging illustrates this step.

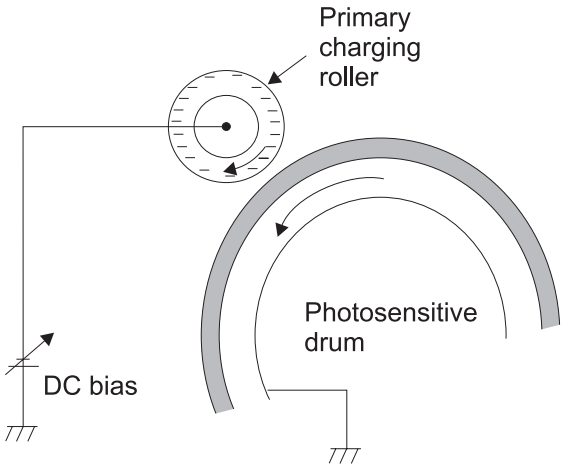


Figure 5-21 Primary charging

Step 3: Laser beam exposure

As the laser beam scans the drum surface it neutralizes the negative charge to form the the electrostatic latent image. The remaining areas, where the laser beam has not struck, retain a negative charge. Figure 5-22 Laser beam exposure illustrates this step.

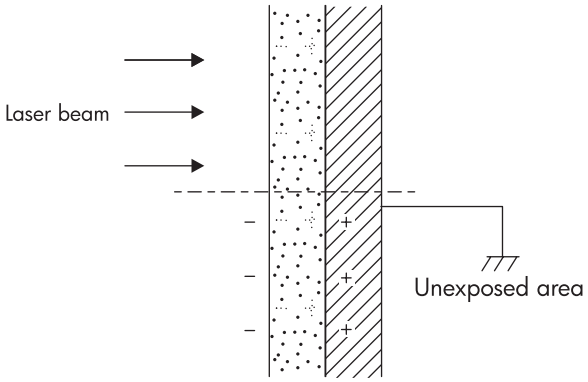


Figure 5-22 Laser beam exposure

Development block

The second part of the image-formation process is the development block, where toner is transferred onto the electrostatic latent image on the surface of the photosensitive drum to create a visible image. This printer uses a contact development method that keeps the developing cylinder in contact with the drum, pushing the toner against the drum surface for development. The toner is non-magnetic and consists of resins. This block consists of two steps:

- Toner charging
- Development

Figure 5-23 Development block shows a cross-section of a print cartridge and illustrates the development block.

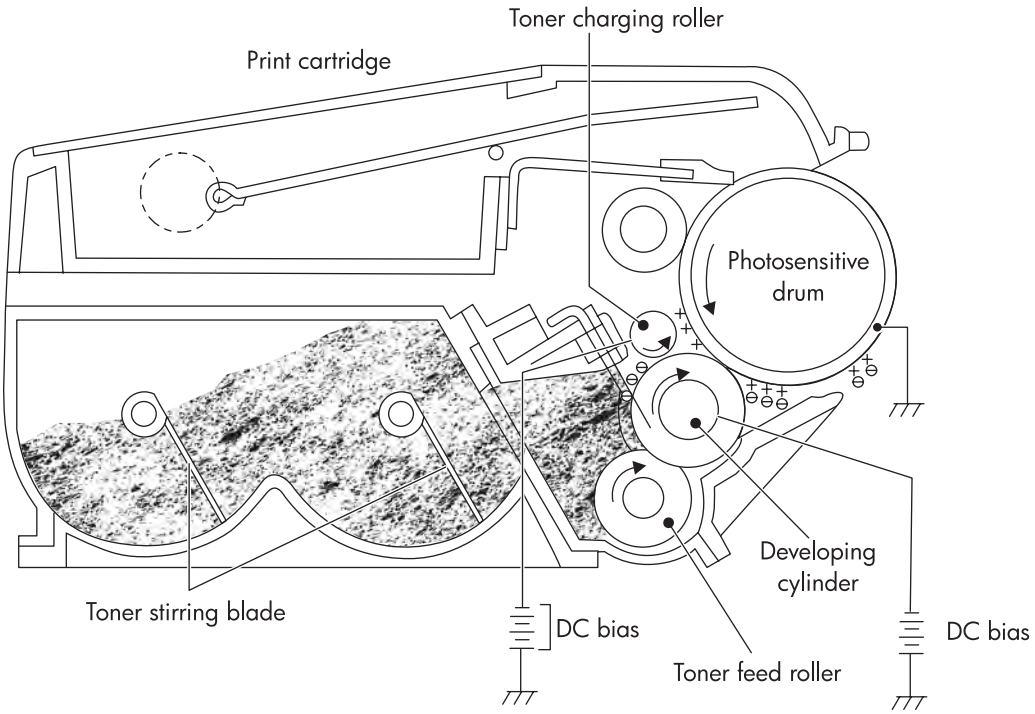


Figure 5-23 Development block

Step 4: Toner charging

As the toner stirring blade turns inside the cartridge, the friction creates a negative potential on the toner. A negative voltage is applied to the toner charging roller and creates a uniform negative potential on the toner.

Step 5: Development

The areas on the photosensitive drum that have been exposed to the laser beam have a higher potential (are less negatively charged) than the toner particles on the developing cylinder. As the photosensitive drum rotates, the toner adheres to the exposed areas on the photosensitive drum. At this point, the image is visible on the drum surface.

Transfer block

The third part of the image-formation process is the transfer block, in which the toner image is transferred from the photosensitive drum to the paper. This block consists of three steps:

- Attaching
- Transfer
- Separation

Step 6: Attaching

After the media is picked up from the input tray, the attaching roller pushes it against the ETB. The attaching roller has a positive dc bias, and it creates a positive charge on the print media. Figure 5-24 Attaching the paper to the ETB illustrates this step.

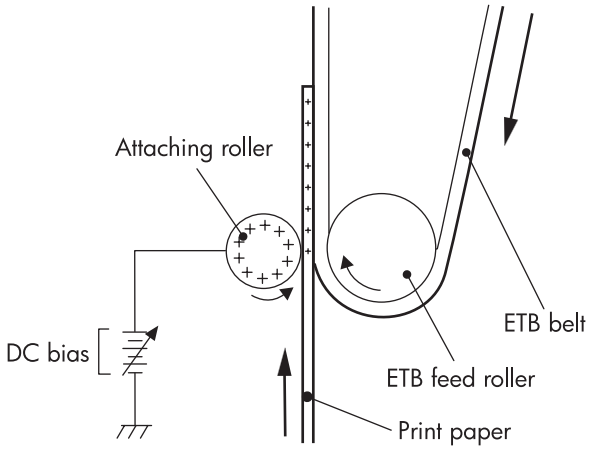


Figure 5-24 Attaching the paper to the ETB

Step 7: Transfer

A positive bias is applied to the transfer charging roller, which is directly opposite the photosensitive drum. As the ETB passes the transfer charging roller, it picks up a positive charge. The negatively charged toner on the photosensitive drum is transferred to the positively charged print media. Figure 5-25 Toner transfer illustrates this step. This process is repeated for each color as the ETB carries the media from the bottom cartridge to the top (C, Y, M, K).

In four-color printing, as four colors of toner are piled up on the media, the holding force of the toner weakens as the transfer process progresses. To counteract this effect, the DC controller increases the positive dc bias that is applied to the transfer charging roller for each successive color.

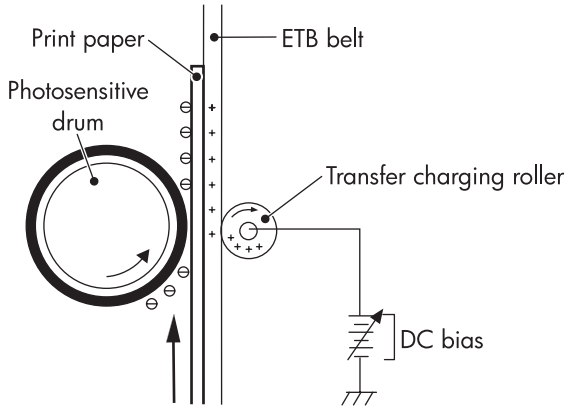


Figure 5-25 Toner transfer

Step 8: Separation

The elasticity of the print media causes it to separate from the ETB as the ETB reaches the top of its path. Figure 5-26 Separation illustrates this step.

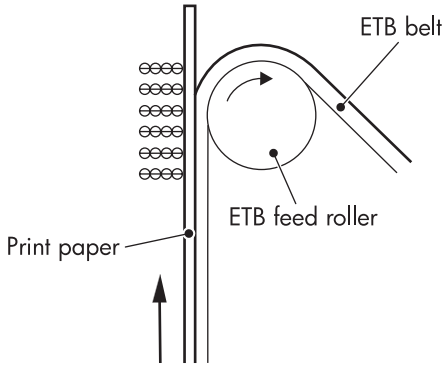


Figure 5-26 Separation

Fusing block

The fourth part of the image-formation process is the fusing block, in which the toner image is fused to the media, making a permanent image that cannot be smeared. This block consists of one step: fusing.

Step 9: Fusing

This printer uses the induction heating method to fuse the toner to the media. This method uses quick fuser heating, resulting in shortened wait time and reduced power consumption. Figure 5-27 Fusing illustrates this step.

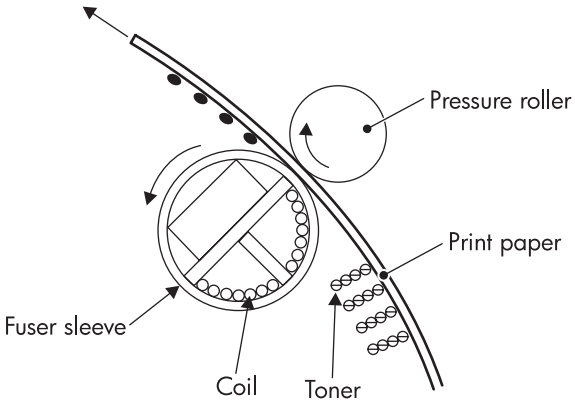


Figure 5-27 Fusing

Cleaning block

The fifth and final part of the image-formation process is the cleaning block, in which the ETB and the photosensitive drums are cleaned, preparing them for the next print. The next section provides more information about printer calibration and cleaning. This block consists of two steps:

- ETB cleaning
- Photosensitive drum cleaning

Step 10: ETB cleaning

See ETB cleaning for a complete discussion of ETB cleaning.

Step 11: Photosensitive drum cleaning

See Photosensitive drum cleaning for a complete discussion of photosensitive drum cleaning.

Calibration and cleaning

The printer automatically calibrates and cleans itself at various times to maintain the best print quality. You can also force the printer to calibrate by selecting **Calibrate Now** (HP Color LaserJet 4600 models), **Quick Calibrate Now**, or **Full Calibrate Now** (HP Color LaserJet 4650 models) from the **Print Quality** menu. For information about calibrating the printer. See Calibrate Now (HP Color LaserJet 4600 models) or Quick Calibrate Now (HP Color LaserJet 4610n and 4650 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models) for more information.

While the printer is calibrating or cleaning, it pauses printing. For most calibrations and cleaning, the printer does not interrupt a print job, but waits for the job to be complete before calibrating or cleaning. Table 5-4 Calibration timing and duration shows when the printer calibrates, the duration of the calibration, and the type of calibration that occurs. Table 5-5 Cleaning timing and duration shows when the printer cleans and the duration of the cleaning. The sections that follow discuss calibration and cleaning in more detail.

To reset the calibration values for the DC controller

Performing an NVRAM initialization clears the calibration values from the formatter, but it does not clear the calibration values from the DC controller. If problems with color-plane registration persist after performing an NVRAM initialization, reset the calibration values for the DC controller.

1. Open the top cover.
2. Press and hold the engine-test switch on the left side of the printer for several seconds.
3. Close the top cover, and observe the control-panel display. If the message **Performing Calibration** appears, the reset was successful.

Table 5-4 Calibration timing and duration

Calibration occurrence	Duration	Type of calibration
When you turn the printer on.	75 seconds for calibration, but because of other initialization activities, the printer takes a total of 2 minutes to be ready for printing	DMAX, DHALF
When you install one or more print cartridges that have not previously been installed in the printer.	150 seconds (2 minutes, 30 seconds)	DMAX, DHALF, color-plane registration (CPR)
When 50 pages have been printed since installing a print cartridge. The printer will finish printing the current job before calibrating.	75 seconds	DMAX, DHALF
When 1,000 pages have printed since the last calibration. The printer will finish printing the current job before calibrating.	75 seconds	DMAX, DHALF
When 8 hours have passed since the last calibration, but not while the printer is in PowerSave mode. Typically, this calibration occurs during the first job or any control-panel interaction after an overnight idle period.	75 seconds	DMAX, DHALF
When you request calibration from the control panel (**CALIBRATE NOW** for	280 seconds (4 minutes, 40 seconds)	DMAX, DHALF, CPR, drum phase

Table 5-4 Calibration timing and duration (continued)

Calibration occurrence	Duration	Type of calibration
HP Color LaserJet 4600 models or **QUICK CALIBRATE NOW** and **FULL CALIBRATE NOW** for HP Color LaserJet 4610n and 4650 models).		

Table 5-5 Cleaning timing and duration

Cleaning occurrence	Duration	Type of cleaning
When the printer continuously prints (with no idle period or spin down) for 51 pages.	either 5 seconds or 21 seconds (5 seconds is the most common)	primary and toner charging rollers
At intervals of 90 and 140 pages. The printer will finish printing the current job before cleaning.	16 seconds	ETB

ETB cleaning

During this step, all toner particles that remain on the ETB are returned to the photosensitive drums in each print cartridge. Figure 5-28 ETB cleaning illustrates this step.

The ETB is automatically cleaned when the printer is turned on, when the covers are closed, and after printing a specified number of pages. The DC controller applies negative bias to the photosensitive drums and either a positive or negative bias to the transfer charging rollers. This creates a difference in potential between the photosensitive drums and the ETB. Both positive and negative residual toner returns to the photosensitive drums.

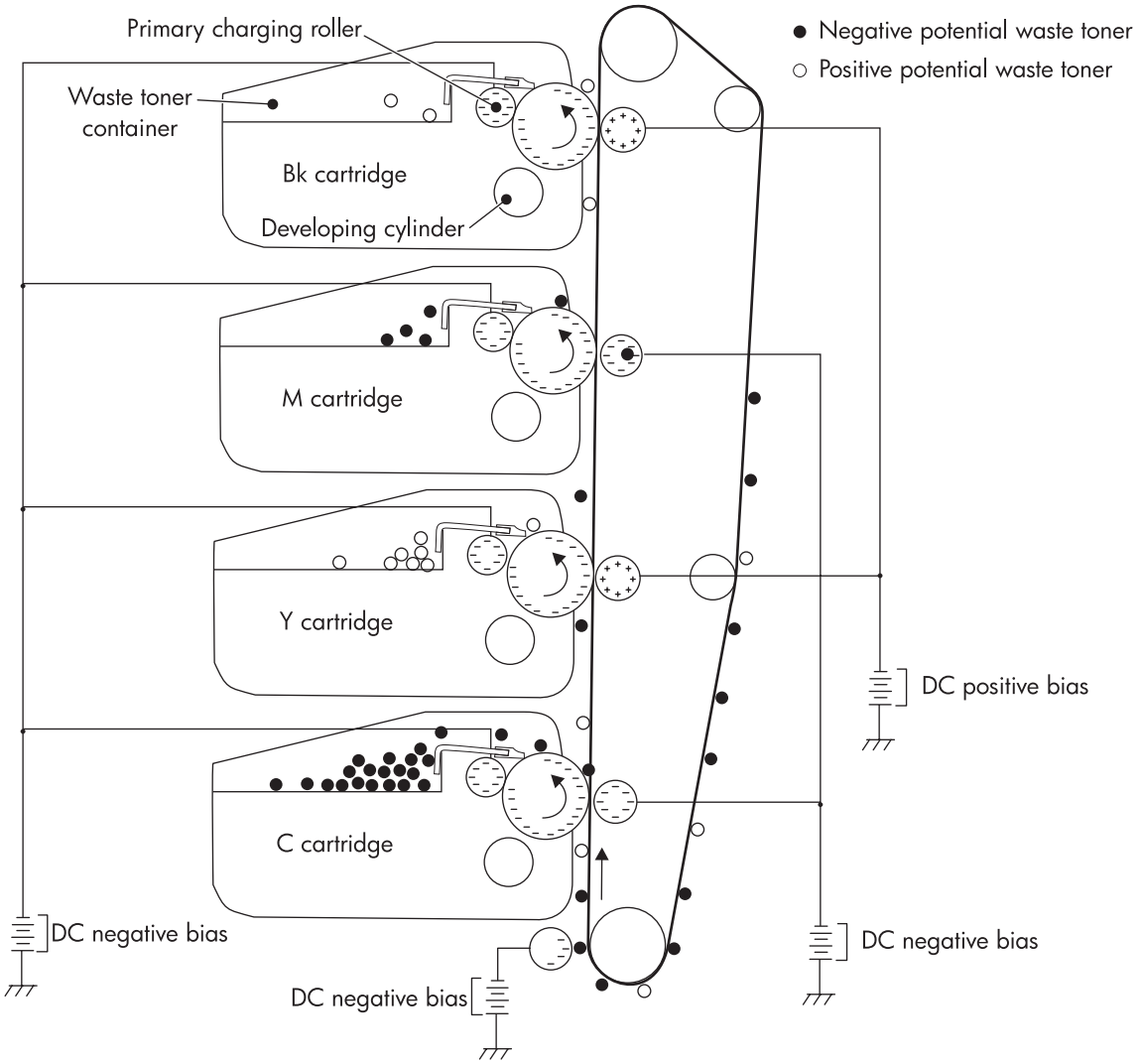


Figure 5-28 ETB cleaning

Photosensitive drum cleaning

A cleaning blade inside the print cartridge clears the remaining toner on the photosensitive drum as the drum rotates past the blade. This waste toner is moved into the waste-toner container in the top of the print cartridge. Figure 5-29 Drum cleaning illustrates this step.

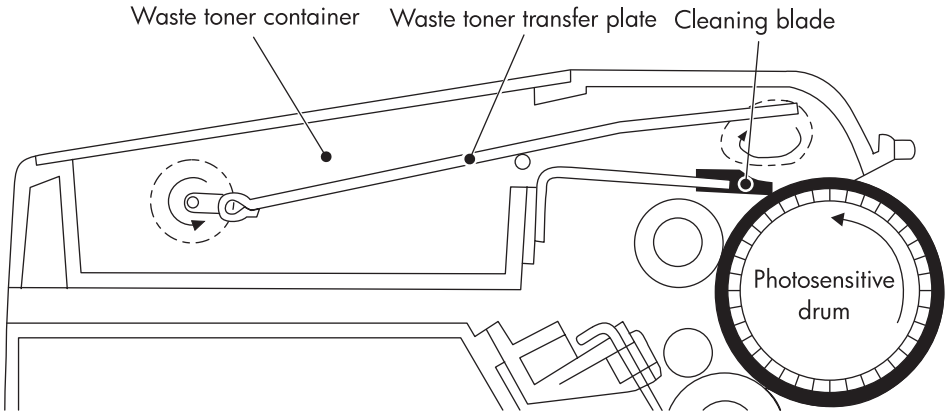


Figure 5-29 Drum cleaning

During the printing process, toner adheres to the primary charging roller and the toner charging roller. To prevent print quality defects, this toner needs to be cleaned. The DC controller alternately applies negative bias in different values to the primary charging roller and the toner charging roller when one of the following occurs:

- The printer is turned on
- The covers are closed
- At the start of a print operation
- After printing a specified number of pages

Applying bias removes the toner from each roller. The toner on the primary charging roller is transferred to the photosensitive drum, and the toner on the toner charging roller is transferred to the developing cylinder. Then the cleaning blade scrapes the toner on the photosensitive drum into the waste-toner container, as described above. The toner on the developing cylinder is returned to the toner case. Figure 5-30 Primary charging roller and toner charging roller cleaning illustrates this process.

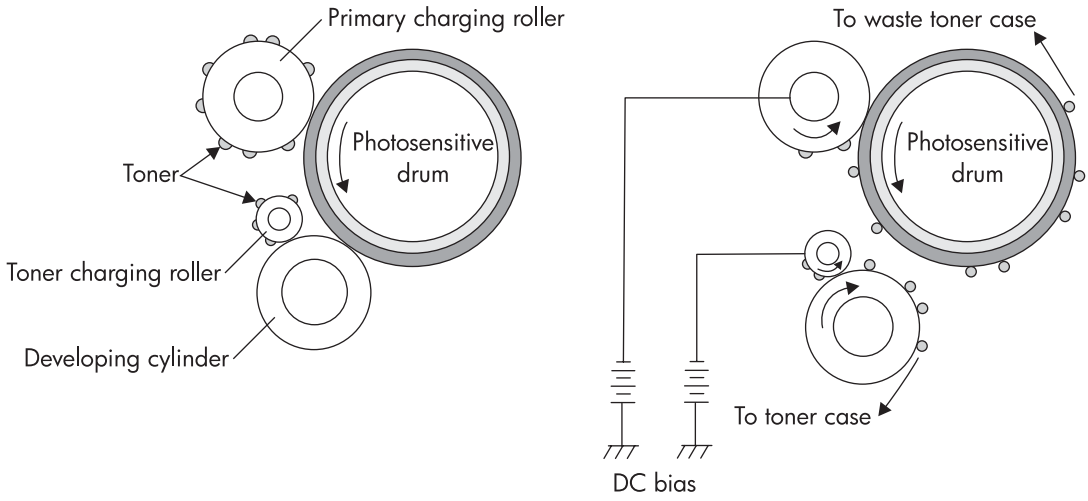


Figure 5-30 Primary charging roller and toner charging roller cleaning

Color-plane registration calibration

The diameter of the rollers in individual print cartridges or ETB units varies from one to another. For this reason, whenever a new print cartridge or ETB unit is installed, the printer must adjust the rotational speed of the rollers in order to ensure good color-plane registration. Color misregistration occurs when the individual colors do not print directly on top of one another. This adjustment consists of two steps:

1. **Direct calibration**. The DC controller uses the color-registration detection unit to measure the color-registration range directly and calibrate the color registration.
2. **Indirect calibration**. The DC controller monitors the rotational speed of each feed roller and controls the speed to prevent color misregistration.

Figure 5-31 Color registration calibration illustrates this process.

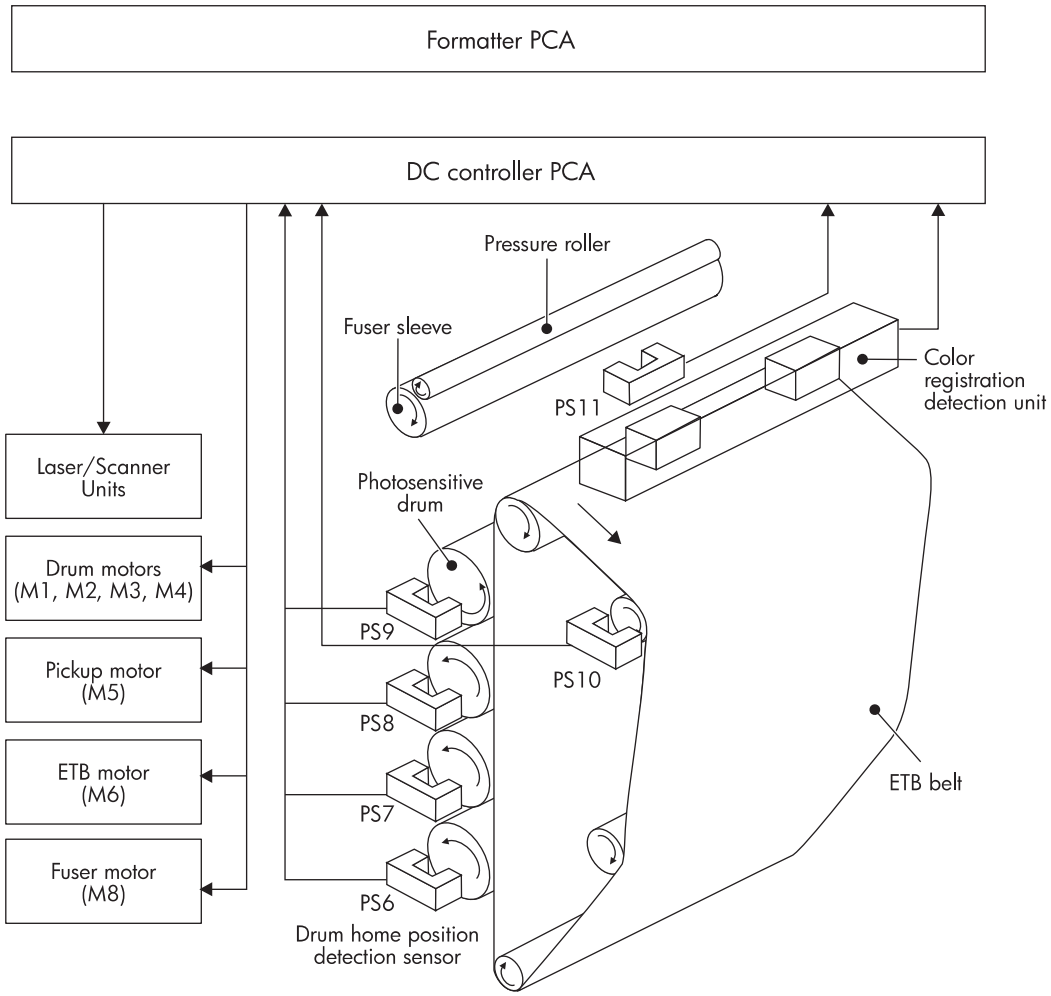


Figure 5-31 Color registration calibration

Drum phase calibration

The drum phase calibration aligns all four cartridge motors and their drive gears.

Image stabilization control

This controls the variation of the image density caused by an environmental change or deterioration of the photosensitive drum, toner, etc.

There are three types of image stabilization control. These controls operate when necessary.

- **Environmental change control**: The environment condition sensor (HP Color LaserJet 4610n and 4650 models) controls the bias according to the environment conditions.
- **Image density control (D-max)**: the color misregistration sensor (PS12) calibrates the bias value when the image density is at max.
- **Image halftone control (D-half)**: The color misregistration sensor (PS12) calibrates the halftone data in the formatter.

Environmental change control (HP Color LaserJet 4610n and 4650 models)

This control calibrates each bias to obtain the best image possible according to environmental changes.

The environment conditions sensor detects the temperature and the humidity. The sensor sends this information to the DC controller in the form of the Temperature Detection signal (TEMSNS) and the Humidity Detection signal (HUMSNS).

The DC controller monitors the environmental conditions of the printer based on these two signals.

The DC controller controls the following biases to prevent image defects when it detects an environmental change.

- Developing bias
- Primary transfer bias
- Secondary transfer bias

If the environment sensor detects a temperature of below -30ºC (22ºF) or over 80ºC (176ºF), the DC controller determines this is an "environment sensor abnormality" and sends an error message to the formatter.

Image density calibration control (DMAX)

This control stabilizes image density by calibrating the values of the developing bias whenever one of the following events occurs:

- When the printer is turned on
- When a print cartridge is replaced
- After a set number of pages have printed
- When the formatter sends an operation command

Image density calibration consists of three steps:

1. The DC controller forms density patterns for each color on the ETB by using varying levels of developing bias.
2. The color registration detection unit measures the image density of the density patterns that are formed on the ETB.
3. The DC controller uses the density measurements to adjust the developing bias to obtain he correct image density.

Image halftone calibration control (DHALF)

This control measures halftone density output from the formatter and returns the measurements to the formatter so it can perform halftone calibration. Image density calibration must always be performed in advance of image halftone calibration.

Image halftone calibration control consists of three steps:

1. Using the optimum developing bias determined during image density calibration, the DC controller forms density patterns on the photosensitive drum in each color cartridge.
2. These density patterns are transferred to the ETB, and the color-registration detection unit measures the image density of these patterns. Image data is returned to the formatter.
3. The formatter uses the image data to perform a halftone calibration in order to obtain an ideal halftone image.

Image density detection

Each of the image stabilization controls uses the color registration unit at the top of the ETB unit to measure image density. The DC controller emits a light from sensors located above the density detection patterns on the ETB. The light reflected off the patterns is returned to the sensor, and the data is returned to the DC controller. Figure 5-32 Image density detection illustrates this process.

When the values that the density sensor detects are outside the specified range, the DC controller resets the image density and issues an “image density sensor out of guaranteed range” warning to the formatter.

If the sensor receives no reflected light, the DC controller stops the printer and issues a “density sensor abnormality” warning to the formatter.

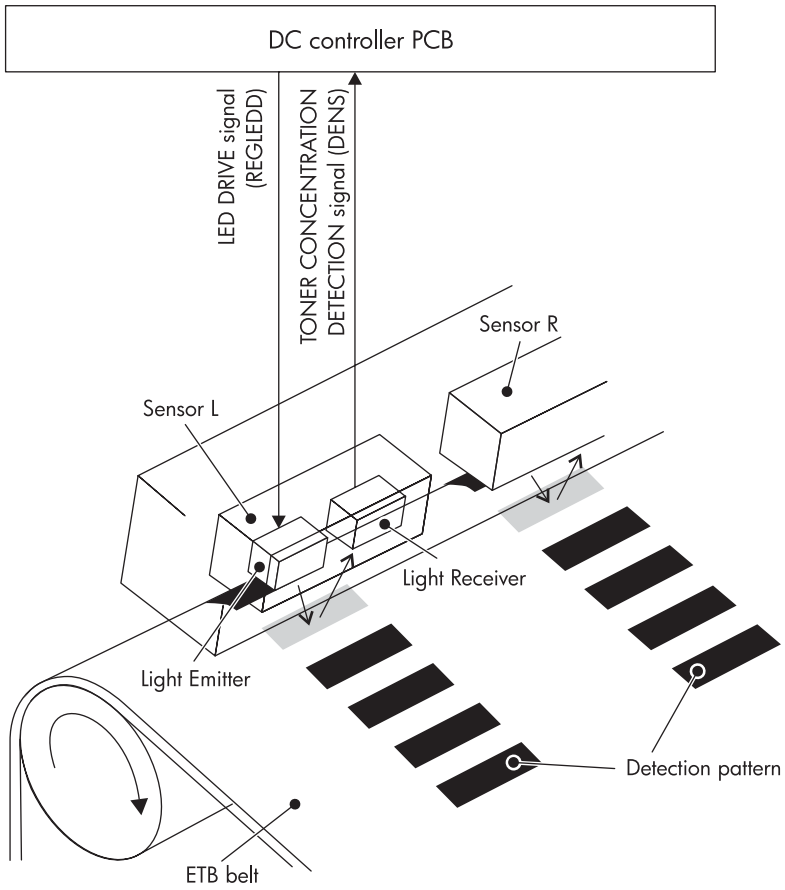


Figure 5-32 Image density detection

Pickup/feed system

The pickup/feed system picks media from the input trays and carries it along the paper path. The printer has one multipurpose tray (tray 1) and one 500-sheet cassette (tray 2). A second 500-sheet paper feeder (tray 3) is available only for the HP Color LaserJet 4600, 4600n, 4650, 4650n, and 4650dn models; it is standard on the 4600dn, 4600dtn, 4600hdn, 4650dtn models. The HP Color LaserJet 4650hdn has 2 x 500-sheet feeder (tray 3/tray 4) assembly. Sensors detect the presence of media in each of these trays. Switches detect the size of the media. Motors and solenoids drive the various feed rollers.

NOTE The 2 x 500-sheet feeder is only available for the HP Color LaserJet 4650 models.

Three photo sensors detect the progress of media along the paper path. If media does not reach or pass one of these sensors within a specified time, the DC controller determines a jam and notifies the formatter. Figure 5-33 Pickup/feed system illustrates this system.

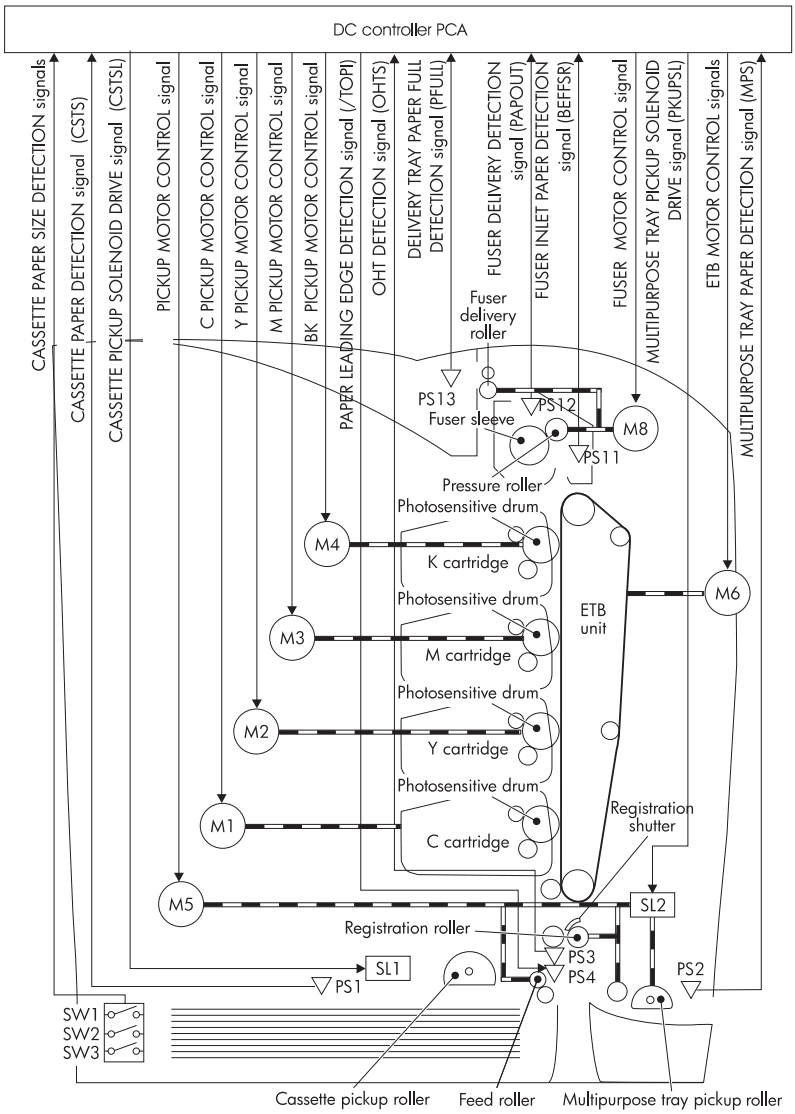


Figure 5-33 Pickup/feed system

The pickup/feed system has the following physical components:

- PS1: Cassette paper sensor
- PS2: Multipurpose tray paper sensor
- PS3: Paper leading edge sensor (top of page)
- PS4: OHT sensor
- PS11: Fuser inlet paper sensor
- PS12: Fuser delivery sensor
- PS13: output bin full sensor
- SW1: Cassette paper size detection switch
- SW2: Cassette paper size detection switch
- SW3: Cassette paper size detection switch
- M1: Cyan drum motor
- M2: Yellow drum motor
- M3: Magenta drum motor
- M4: Black drum motor
- M5: Pickup motor
- M6: ETB motor
- M8: Fuser motor
- SL1: Cassette pickup solenoid
- SL2: Multipurpose tray pickup solenoid

Figure 5-34 Pickup/feed system illustrates the pickup/feed system, which can be divided into three units:

- **Pickup/feed unit**. From the point the media is picked from the tray until it reaches the fuser
- **Fuser/delivery unit**. From the fuser to the output bin
- **Duplex feed unit**. From the output bin to the registration shutter at the bottom of the ETB

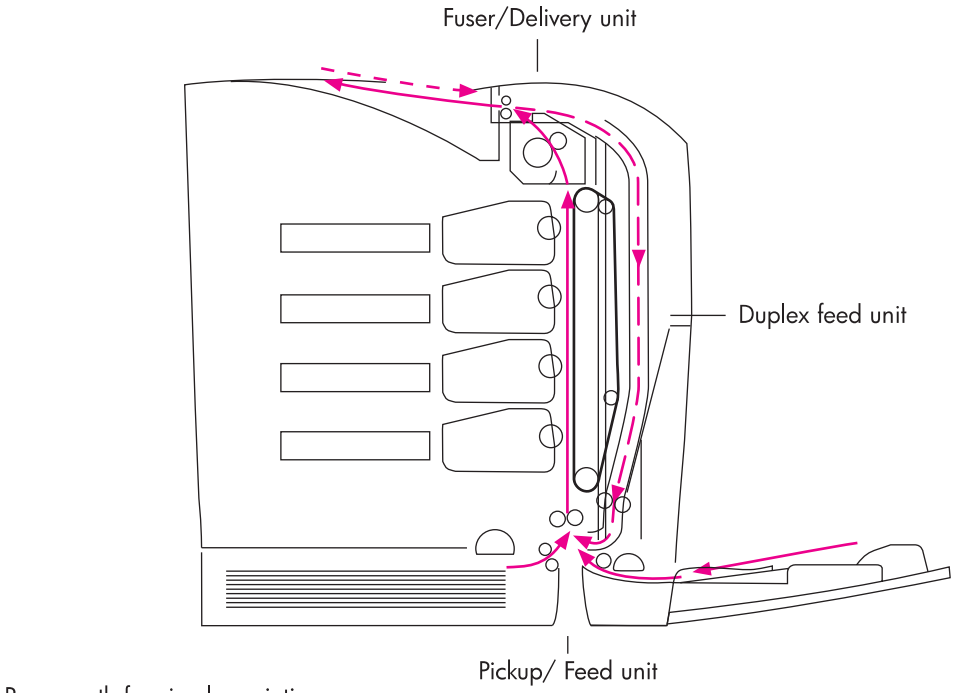


Figure 5-34 Pickup/feed system

Pickup/feed unit

At the bottom of the paper path, the pickup unit picks individual pieces of media from the trays. Then the ETB carries the media to the top of the paper path. The following sequence of events occurs:

1. The formatter sends a print command to the DC controller, which rotates the pickup motor, the drum motors, the ETB motor, and the fuser motor.
2. The cassette feed roller and registration roller rotate as the pickup motor starts to rotate.
3. Media is picked from the cassette or multipurpose tray. A separation claw in the cassette prevents picking multiple sheets of media. A separation pad in the multipurpose tray prevents multiple sheets from feeding.
4. The registration shutter corrects any skew in the media, and the media is fed at a specified speed, according to the size and type of the media.
5. As the ETB carries the media past each print cartridge, toner is transferred onto the media.

Cassette detection and cassette paper-size detection

The printer can sense whether the cassette (tray 2, tray3/tray 4) is installed correctly, and it can sense the size of the paper in the cassette. Paper-size detection switches at the back of the cassette send this information to the DC controller. The DC controller determines which size is loaded by reading various switches. See Table 5-6 Cassette paper-size detection. Figure 5-35 Cassette paper-size detection switches shows how the switches are stacked.

Table 5-6 Cassette paper-size detection

Paper size	Paper-size detection switch		
	SW1	SW2	SW3
A4	on	off	off
B5	on	on	off
A5	on	off	on
Letter	off	on	on
Legal	off	off	on
Executive	off	on	off
Custom	on	on	on
No cassette	off	off	off

Although the cassette determines the paper size by reading the switches, it is possible that the user can select a different size from what is loaded, creating an error in paper-size detection.

The paper leading-edge sensor detects when the leading edge and the trailing edge of a sheet pass it. By measuring the time between the passing of the leading edge and trailing edge, the sensor can determine the actual size of the sheet. If this measured size differs from the size specified by the formatter or the switch combination, the DC controller determines a mismatch. The sheet is ejected from the printer, and the printer stops.

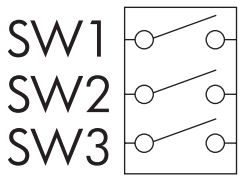
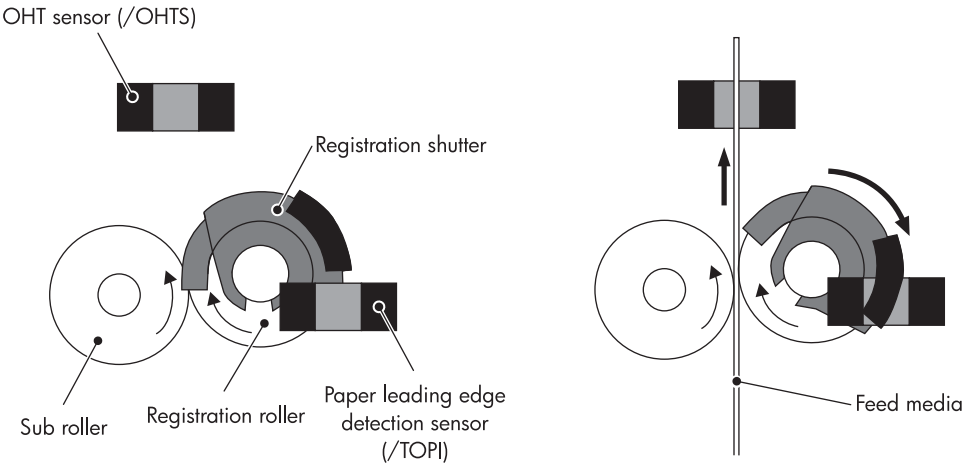


Figure 5-35 Cassette paper-size detection switches

Overhead transparency detection

In order to prevent print-quality problems, the printer prints more slowly on overhead transparencies (OHT) than on plain paper. A sensor above the paper leading edge sensor detects an OHT and signals the DC controller to slow the motors accordingly.

The OHT sensor uses a light-transmitter and light-receiver to detect the presence of plain paper. When plain paper passes through the sensor, the light is blocked, and the OHT signal changes from low to high. Consequently, when the signal is not blocked, but the paper leading-edge sensor detects a sheet, the DC controller determines that the media is an OHT. Figure 5-36 Overhead transparency detection illustrates this process.



Signal \ Media	Normal	Plain paper	OHT
/TOPI signal	H	L	L
/OHTS signal	L	H	L

Figure 5-36 Overhead transparency detection

Small-size paper detection

Because the printer's overhead transparency detection sensor is installed at the end of the feed path, small-size paper that does not pass the edge of the feed path can be mistaken for an OHT. To avoid this problem, the printer has a lever in front of the OHT detection sensor to distinguish small-sized paper. Small-size paper is too narrow to trip the lever. When the lever is tripped, the flag attached to the lever momentarily blocks light from reaching the OHT detection sensor, indicating that the media is full width. The DC controller determines whether the media is an OHT or a sheet of paper based on whether the OHT sensor remains shaded from light as the media passes through. If the lever is not triggered, the DC controller determines that the media is small-size paper. Figure 5-37 Small-size paper detection illustrates this process.

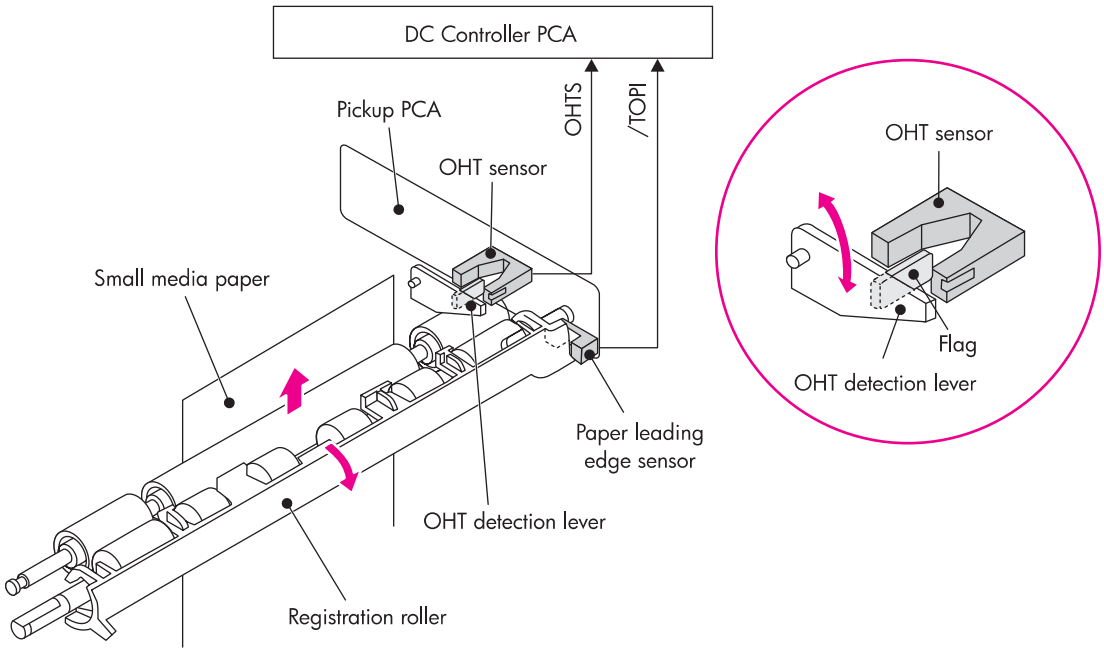


Figure 5-37 Small-size paper detection

Feed-speed control

The type of media in the paper path dictates the speed at which it is fed. The DC controller can change the feed speed according to type of media. Table 5-7 Feed speed according to media shows the relationship between media type and feed speed.

Table 5-7 Feed speed according to media

Feed mode	Media type	Print mode	Feed speed
Normal mode	Plain paper	Full color	normal
		Monochrome	
OHT mode	Overhead transparency	Full color	1/4 speed
		Monochrome	1/2 speed
Thick 1 mode	Thick paper	Full color	1/2 speed
		Monochrome	
Thick 2 mode	Thick paper	Full color	1/2 speed (CLJ 4600)
		Monochrome	1/3 speed (CLJ 4610n and 4650)
Gloss 1 mode	Glossy paper	Full color	1/3 speed
		Monochrome	
Gloss 2 mode	Glossy paper	Full color	1/3 speed
		Monochrome	
Image mode (high glossy mode; CLJ 4650 only)	Glossy paper	Full color	1/4 speed
		Monochrome	
Gloss film mode	Glossy film	Full color	1/3 speed (CLJ 4600)
		Monochrome	1/4 speed (CLJ 4610n and 4650)
Envelope mode	Envelope	Full color	normal
		Monochrome	
Thick paper mode	Thick paper	Full color	normal
		Monochrome	
Label paper mode	Adhesive labels	Full color	1/2 speed
		Monochrome	
Auto mode	■ Plain paper ■ OHT	Full color	Automatically adjusts for media
		Monochrome	

The DC controller determines a media mismatch, ejects the media, and stops the printer in the following situations:

- When OHT is detected and the printer is set to either thick paper or gloss mode
- When plain paper is detected and the printer is set to OHT mode

However, if the printer is set to plain-paper mode and OHT is detected, the DC controller will automatically switch the printer to OHT mode, and printing continues normally.

Fuser/delivery unit

The fuser/delivery unit consists of the fuser, which melts the toner and presses it onto the media, and the delivery unit, which feeds the sheets into the output bin. The sequence of events is as follows:

1. The ETB carries a sheet of media with transferred toner into the fuser.
2. The fuser motor adjusts its speed to maintain even tension on the media as it enters the fuser.
3. The fuser melts the individual toner particles. The fuser sleeve and pressure roller mix the liquefied toner and press it onto the media to create the appropriate color.
4. The media passes from the fuser into the output bin.

A sensor in the output bin detects when the bin is full. The DC controller will stop the printer after the current print job is complete.

Duplex feed unit

During two-sided (duplex) printing, the duplex feed unit retrieves the paper from the output bin and sends it back through the pickup/feed unit to print on the second side. The sequence of events is as follows:

1. The paper, with the front side printed, passes through the fuser.
2. The fuser motor (M8) rotates counterclockwise for a specified length of time after the paper reaches the fuser delivery sensor. The fuser delivery roller reverses direction and feeds the paper into the duplex feed unit. Figure 5-38 Duplex switch back illustrates this "switch back" operation.
3. The oblique roller and feed roller feed the left edge of the paper so that it contacts the left-side plate in order to align the paper on the left margin.
4. The paper then re-enters the pickup/feed unit and the second side is printed.
5. The paper passes through the fuser a second time and comes to rest in the output bin.

NOTE **HP CLJ 4600 and 4650 models only**: During duplex printing, the printer prints the second side of the page first. For instance, if a four-page print job is to be printed on two sheets of paper, pages 2 and 4 print first, and then pages 1 and 3 print. For this reason, when preprinted letterhead is used for duplex printing, be sure to load the letterhead face-down in tray 2, tray 3, or tray 3/tray 4 (HP CLJ 4650 models only), and load letterhead face-up in tray 1.

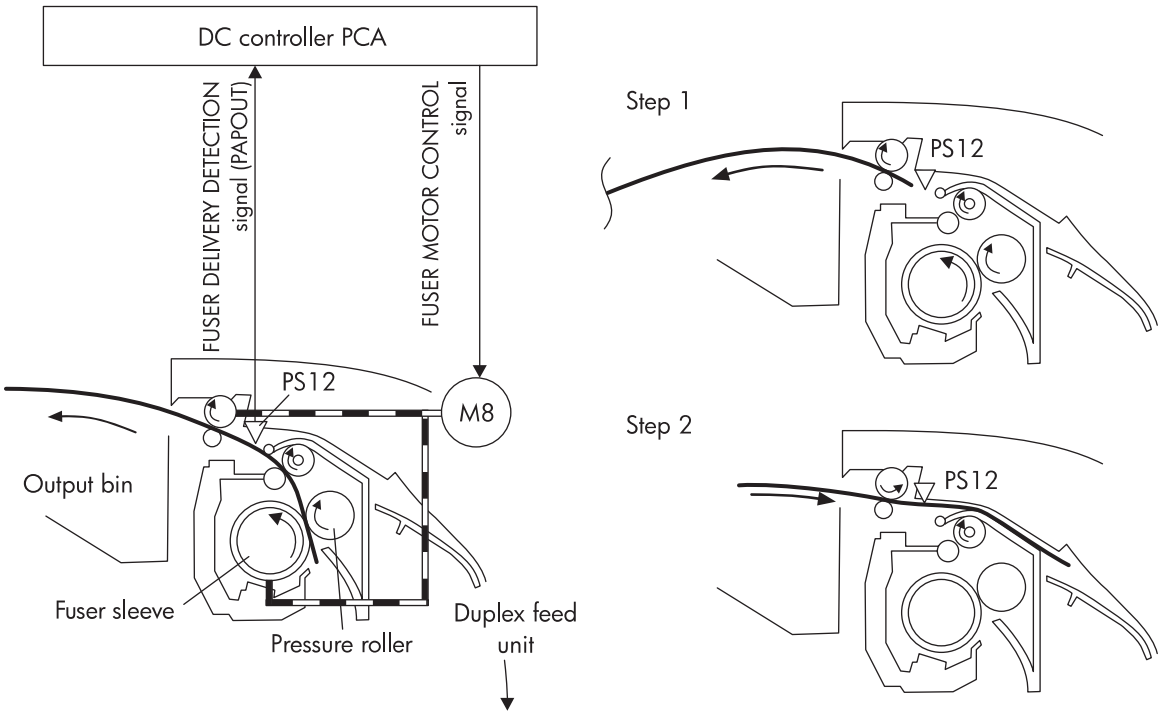


Figure 5-38 Duplex switch back

500-sheet paper feeder

The HP Color LaserJet 4600dtn, 4600hdn, and 4650dtn printer models come standard with an additional 500-sheet paper feeder. It is an option for all other models except the HP Color LaserJet 4610n printer. This additional tray (tray 3) operates in the same way as tray 2. Figure 5-39 Additional 500-sheet paper feeder shows the paper path with the additional 500-sheet paper feeder installed.

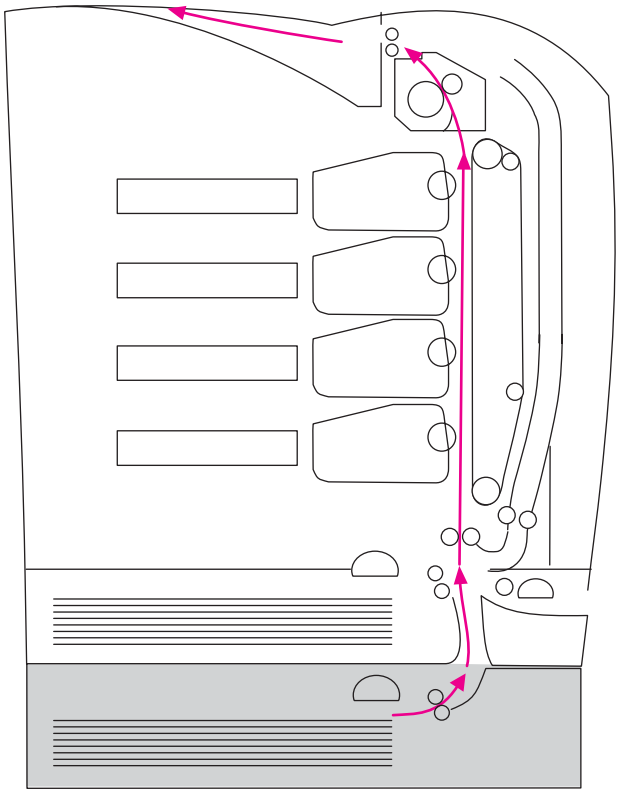


Figure 5-39 Additional 500-sheet paper feeder

Pickup and feed operations

The following is the sequence of operations for the 500-sheet paper feeder. Figure 5-40 500-sheet paper feeder pickup and feed operation illustrates this sequence.

1. The DC controller receives a print command from the formatter and sends a pickup command to the paper feeder driver.
2. The paper feeder driver rotates the main motor (M4001) in the paper feeder, and the feed roller starts to rotate.
3. After the printer enters the Scanner Ready state, the DC controller instructs the paper feeder driver to pick a sheet of media. The paper feeder pickup solenoid (SL4001) turns on. The pickup roller makes one rotation and picks up media from the paper feeder.
4. Separation pads eliminate extra sheets, and a single piece of media enters the feed path.

NOTE Paper-size detection for the 500-sheet feeder is the same as that described in Cassette detection and cassette paper-size detection. For the 500-sheet feeder, SW4001, SW4002, and SW4003 are the equivalent of SW1, SW2, and SW3, respectively, in the 500-sheet cassette.

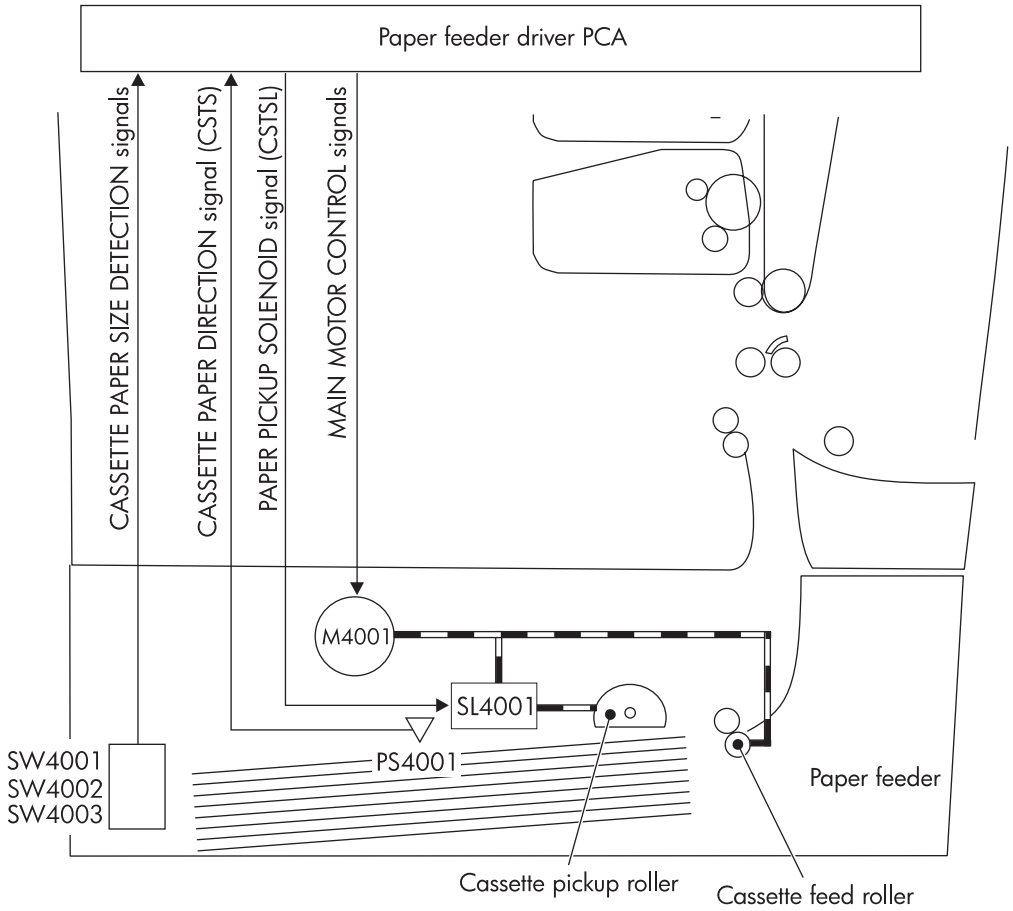


Figure 5-40 500-sheet paper feeder pickup and feed operation

2 x 500-sheet feeder

The optional 2 x 500-sheet feeder (available for HP Color LaserJet 4650 models; standard on the HP Color LseJet 4650hdn printer) provides two 500-sheet casettes that accept a variety of paper types and sizes. Each cassette can hold 56 mm (2.2 inches) of 80-g/m^2 (21-lb) media (about 500 sheets).

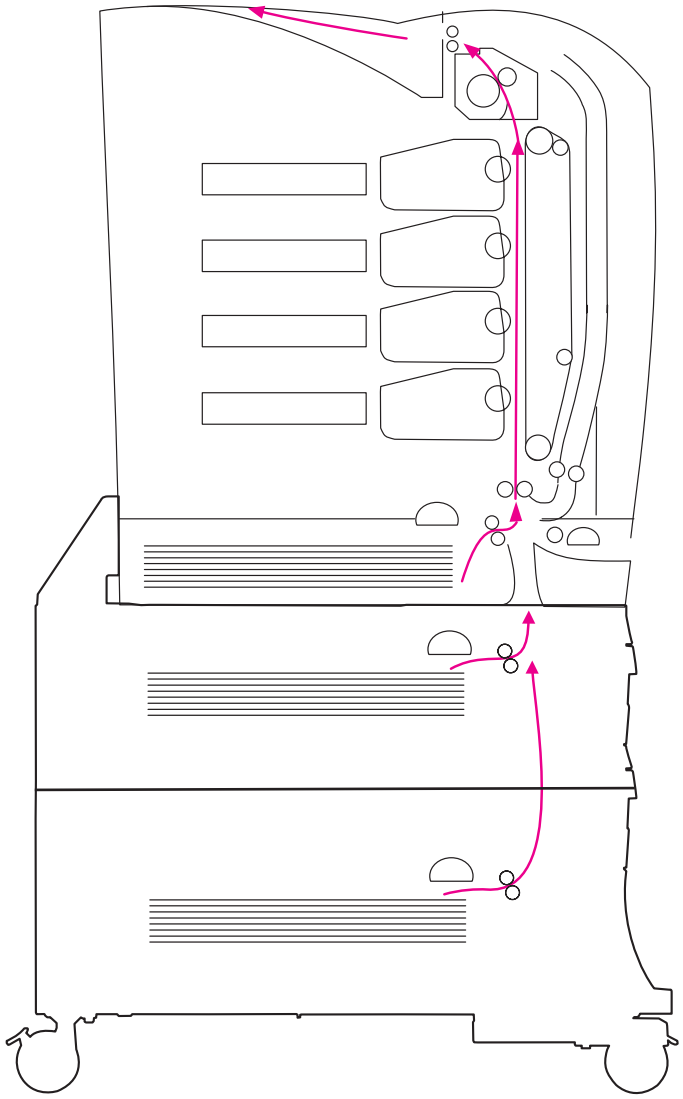


Figure 5-41 2 x 500-sheet feeder

Pickup and feed system

The following is the sequence of operations for the 2 x 500-sheet paper feeder (the sequence of operation is the same for either cassette). Figure 5-42 2 x 500-sheet feeder pickup and feed operation illustrates this sequence.

1. The DC controller receives a print command from the formatter and sends a pickup command to the paper feeder driver.
2. The paper feeder driver rotates the main motor (M1) in the paper feeder, and the feed roller starts to rotate.
3. After the printer enters the SCANNER READY state, the DC controller instructs the paper feeder driver to pick a sheet of paper. The paper feeder pickup solenoid (SL1 for tray 3; SL2 for tray 4) turns on. The pickup roller makes one rotation and picks up paper in the cassette.
4. Separation pads eliminate any extra sheets, and a single piece of paper enters the feed path.

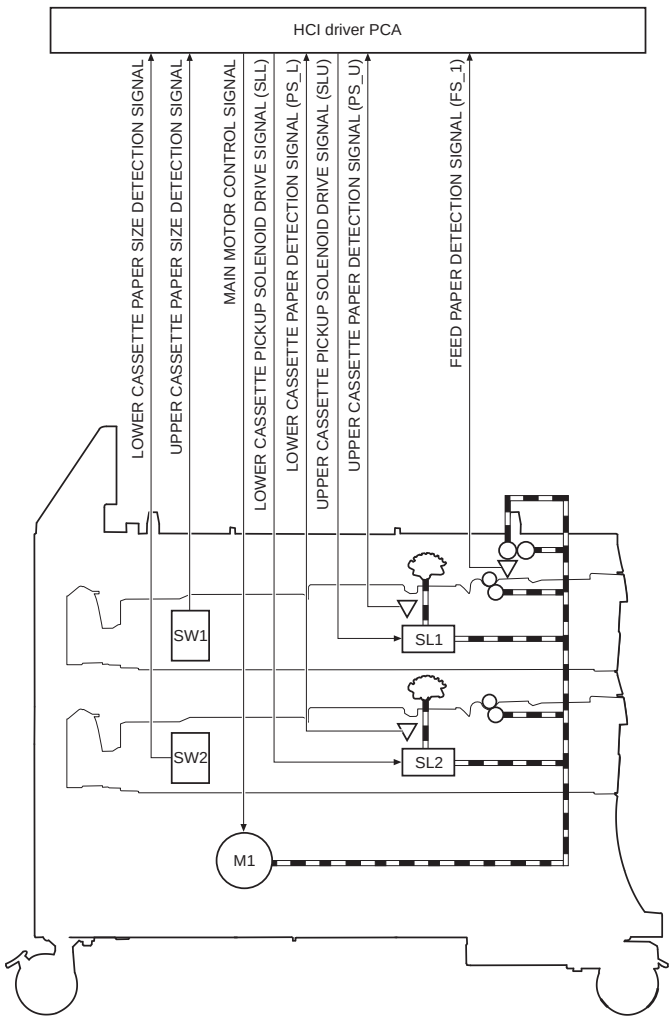


Figure 5-42 2 x 500-sheet feeder pickup and feed operation

Cassette detection and cassette paper-size detection

The printer can sense whether the cassette (tray 3/4) is installed correctly, and it can sense the size of the paper in the cassettes. Paper-size detection switches at the back of the cassettes send this information to the DC controller. The DC controller determines which size is loaded by reading various switches. See Table 5-8 Cassette paper size detection (2 x 500-sheet feeder). Figure 5-43 Cassette paper size detection switches (2 x 500-sheet feeder) shows how the switches are stacked.

Table 5-8 Cassette paper size detection (2 x 500-sheet feeder)

Paper size	Paper-size detection switch		
	SW1	SW2	SW3
A4	on	off	off
B5	on	on	off
A5	on	off	on
Letter	off	on	on
Legal	off	off	on
Executive	off	on	off
Custom	on	on	on
No cassette	off	off	off

Although the cassette determines the paper size by reading the switches, it is possible that the user can select a different size from what is loaded, creating an error in paper-size detection.

The paper leading-edge sensor detects when the leading edge and the trailing edge of a sheet of paper pass it. By measuring the time between the passing of the leading edge and trailing edge, the sensor determines the actual size of the sheet. If this measured size differs from the size specified by the formatter or the switch combination, the DC controller determines a mis-match. The sheet is ejected from the printer, and the printer stops.

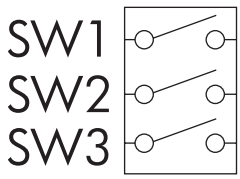


Figure 5-43 Cassette paper size detection switches (2 x 500-sheet feeder)

6 Removal and replacement

This chapter contains information about the following topics:

- Introduction
- Supplies
- Covers and external components
- Internal components
- Optional 500-sheet paper feeder (HP Color LaserJet 4600 and 4650 models only)
- Optional 2 x 500-sheet paper feeder (tray 3/tray 4) (HP Color LaserJet 4650 only)

Introduction

This chapter explains how to remove and replace major printer components. (HP does not support repairing individual subassemblies or troubleshooting to the component level.) This chapter includes exploded-view illustrations of the printer and paper-handling accessories. If an assembly or part does not have a reference number in the illustration and is not listed in the parts list, it is not a field replaceable unit (FRU).

Replacement is generally the reverse of removal. Occasionally, directions for difficult or critical replacement procedures are included.

WARNING! The information in this section is intended for authorized service personnel only.

Repair notices

WARNING! Turn the printer off, wait five seconds, and then unplug the power cord before servicing the printer. Failure to completely disconnect the printer can result in severe injury.

Never operate or service the printer with the protective cover removed from the laser/scanner assembly. The reflected beam, although invisible, can damage your eyes.

Never operate the printer with any parts removed.

The sheet-metal parts can have sharp edges. Be careful not to cut yourself when handling sheet-metal parts.

Caution regarding electrostatic discharge (ESD)

The printer contains parts that are sensitive to electrostatic discharge (ESD). Watch for the ESD reminder when removing printer parts. Protect the PCA parts with protective ESD pouches.

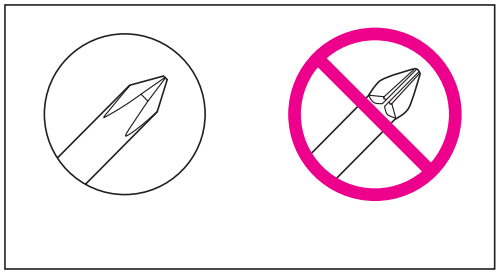
Always use an ESD protected work station when servicing the printer or paper-handling accessories. If an ESD work station is not available, ground yourself to discharge body static by touching the metal chassis of the printer or accessory.

Required tools

Before servicing the printer, gather the following tools:

- Phillips #2 magnetized screwdriver (152-mm [6-inch] shaft)
- Small flat-blade screwdriver
- Small needle-nose pliers
- ESD strap
- Penlight (optional)

All components in the HP Color LaserJet 4600 Series printer use Phillips-head screws that require a #2 Phillips screwdriver. Make sure that you have a Phillips screwdriver and not a posidriv screwdriver. Figure 6-1 Phillips and posidrive screwdriver comparison shows the difference between a Phillips and a posidriv screwdriver. The surfaces on a Phillips tip are more beveled surfaces.



Phillips posidrive

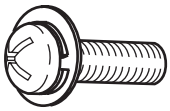
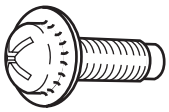
Figure 6-1 Phillips and posidrive screwdriver comparison

Types of fasteners

Table 6-1 Types of fasteners describes the screws used in the printer and provides guidelines to help determine where to use each type of screw. The screws vary in length depending on the thickness of the material being fastened.

Always note where each type of screw is located and replace each one into its original location.

Table 6-1 Types of fasteners

Illustration	Description	Uses
	Screw, machine with washer M3x8 part number xA9-1276-000CN	To hold plastic to metal. For example: printer covers
	Screw, self tapping	To hold plastic to plastic. For example: printer cover to a plastic hinge
	Screw, truss head M3x6 part number xA9-1275-000CN	To hold sheet metal to sheet metal. For example: formatter cage
	Retaining ring (e-type)	To hold a shaft through a slot. For example: keep a gear on a shaft

Supplies

The customer replaces print cartridges, the fuser, and the ETB as they are depleted. The printer tracks the amount of use on the customer-replaceable supplies by keeping a page count. Swapping supplies between printers might cause a misrepresentation of supply life values and is not recommended.

If you replace either the fuser or the transfer unit, and these supplies have not yet reached the end of their estimated life, you must reset the page count for these supplies through the **Configure device** menu on the control panel. See Replacing the fuser when it is not at end of life and Replacing the transfer unit when it is not at end of life for instructions.

Table 6-2 Approximate replacement intervals for supply items

Supply item	Printer message	Page counts	Approximate replacement interval[1]	To install or order
Black (K) print cartridge	**REPLACE BLACK CARTRIDGE**	9,000 pages[2]	2.7 months	Installing the print cartridges For part numbers, see Supplies and accessories in chapter 8.
Cyan (C) print cartridge	**REPLACE CYAN CARTRIDGE**	8,000 pages[2]	2.7 months	Installing the print cartridges For part numbers, see Supplies and accessories in chapter 8.
Magenta (M) print cartridge	**REPLACE MAGENTA CARTRIDGE**	8,000 pages[2]	2.7 months	Installing the print cartridges For part numbers, see Supplies and accessories in chapter 8.
Yellow (Y) print cartridge	**REPLACE YELLOW CARTRIDGE**	8,000 pages[2]	2.7 months	Installing the print cartridges For part numbers, see Supplies and accessories in chapter 8.
Image transfer kit (ETB)	**REPLACE TRANSFER KIT**	120,000 pages[3]	40 months	Replacing the transfer unit For part numbers, see Supplies and accessories in chapter 8.

Table 6-2 Approximate replacement intervals for supply items (continued)

Image fuser kit	**REPLACE FUSER KIT**	150,000 pages [3]	50 months	Replacing the fuser For part numbers, see Supplies and accessories in chapter 8.

[1] Approximate life expectancies based on 3,000 pages per month.
[2] The approximate average A4/Letter-size page count is based on 5% coverage of individual colors. Page counts are only estimations; usage conditions and print patterns cause results to vary.
[3] Page counts are only estimations; usage conditions and print patterns cause results to vary.

CAUTION The Hewlett-Packard Company recommends the use of HP products in this printer. Use of non-HP products can cause problems that require service that is not covered by the Hewlett-Packard Company warranty or service agreements.

Print cartridges and ETB

It is recommended that you remove the print cartridges and ETB when servicing internal printer components. Place the print cartridges and ETB in a safe place while they are out of the printer. To avoid damaging the print cartridges, do not expose them to direct bright light.

CAUTION Grasp the print cartridges by the blue handles to avoid accidentally touching the photosensitive drum inside each cartridge.

CAUTION Do not place any items on the ETB. If the belt is punctured or otherwise damaged, print quality problems will result. Avoid touching the belt surface. Skin oils can cause print quality problems.

For instructions about removing the print cartridges, see chapter 4.

For instructions about removing the ETB, see chapter 4.

Covers and external components

The following procedures explain the removal and replacement of covers and external components.

Rear cover

1 Remove two screws (callout 1).

2 Pull out on the left side of the rear cover, and slide it to the left to remove it (callout 2).

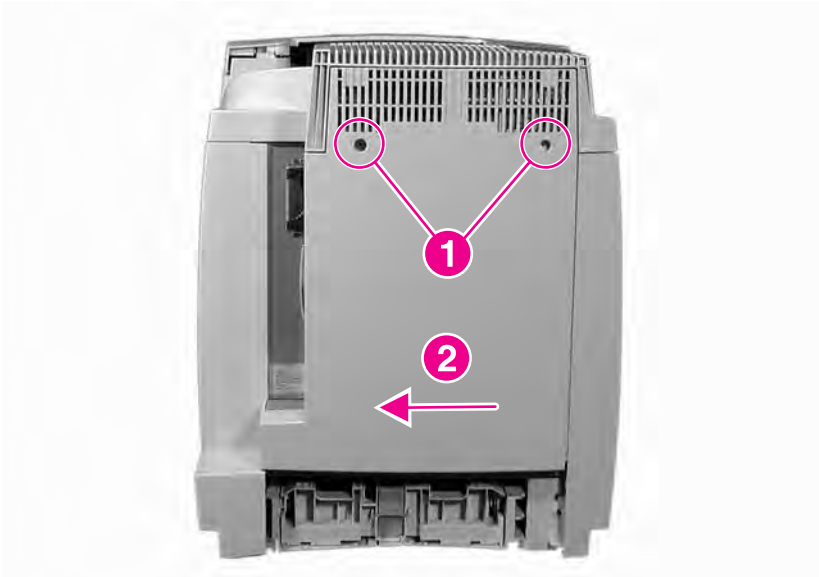


Figure 6-2 Remove the rear cover

Top cover

WARNING! The fuser might be hot. Wait 10 minutes for it to cool down before removing it.

1. Lift the top cover and remove the fuser. See Replacing the fuser for instructions about removing the fuser.
2. Using your fingers or needle-nose pliers, pinch and release the white plastic clips (callout 1) on the damper arm on the left side of the cover. It is easier to pinch these clips if you tip the top cover forward slightly.

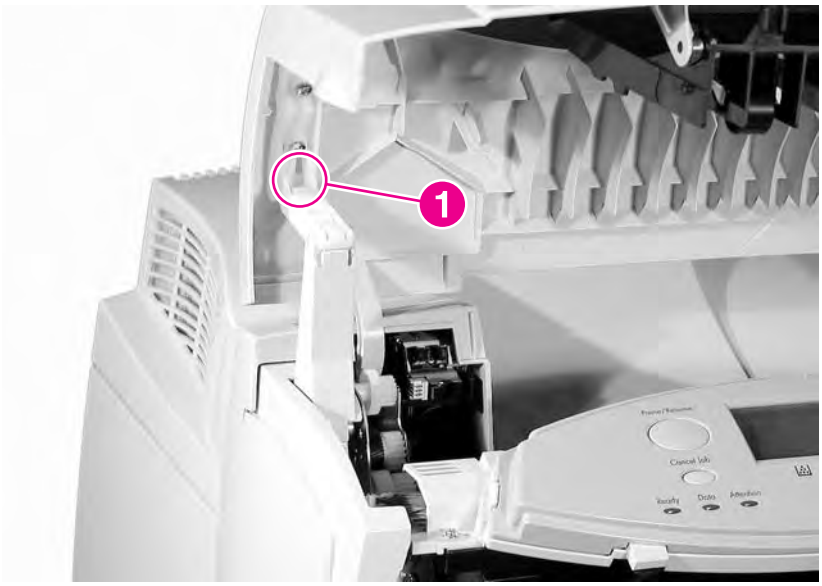


Figure 6-3 Remove the top cover (1 of 2)

3 Disengage the tab (callout 2) and remove the retaining block.

Figure 6-4 Remove the top cover (2 of 2)

4 Push the cover to the left to release the hinge pin on the right side, and then pull the cover to the right to release the hinge pin on the left side and remove the cover.

Rear top cover

1 Remove the following assemblies:

- Rear cover. See Rear cover.
- Top cover. See Top cover.

2 Remove three screws (callout 1).

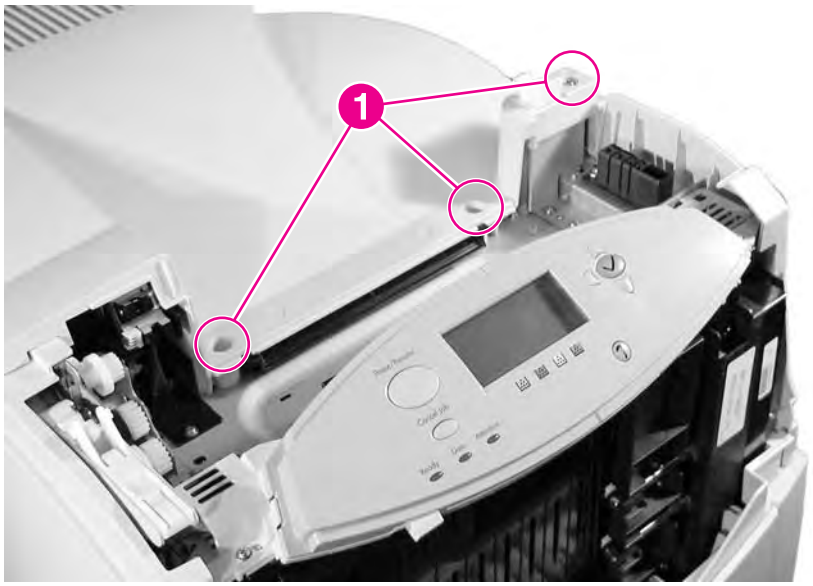


Figure 6-5 Remove the rear top cover (1 of 3)

3 Insert a flat-blade screwdriver between the rear top cover and side cover on the right side of the printer.

4 Lift the screwdriver slightly to disengage the tabs (callout 2 in Figure 6-6 Remove the rear top cover (2 of 3) on the right side of the printer.

5 Repeat steps 3 and 4 for the left side tabs (callout 2 in Figure 6-7 Remove the rear top cover (3 of 3) on the left side of the top rear cover, and then remove the rear top cover.

Figure 6-6 Remove the rear top cover (2 of 3)

Figure 6-7 Remove the rear top cover (3 of 3)

Left cover

1 Remove the following assemblies:

- Rear cover. See Rear cover.
- Top cover. See Top cover.
- Rear top cover. See Rear top cover.

2 Open the front cover, and then Remove one screw (callout 1) and disengage the locking tabs (callout 2).

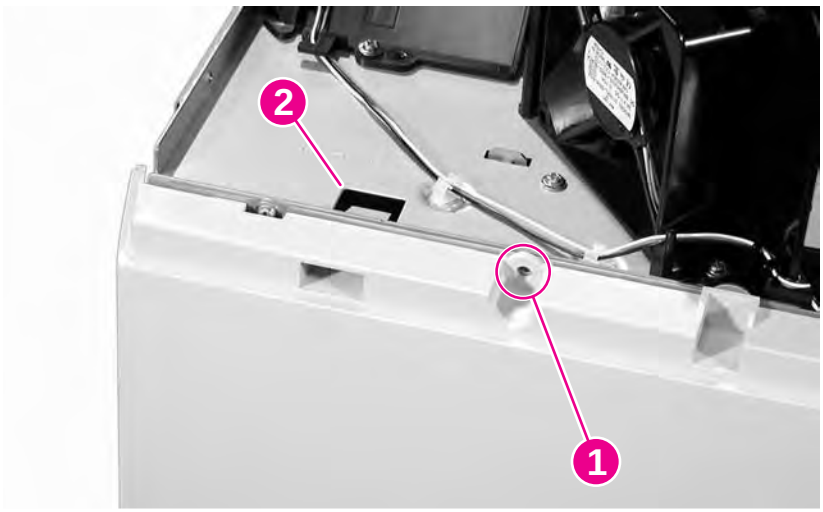


Figure 6-8 Remove the left cover (1 of 2)

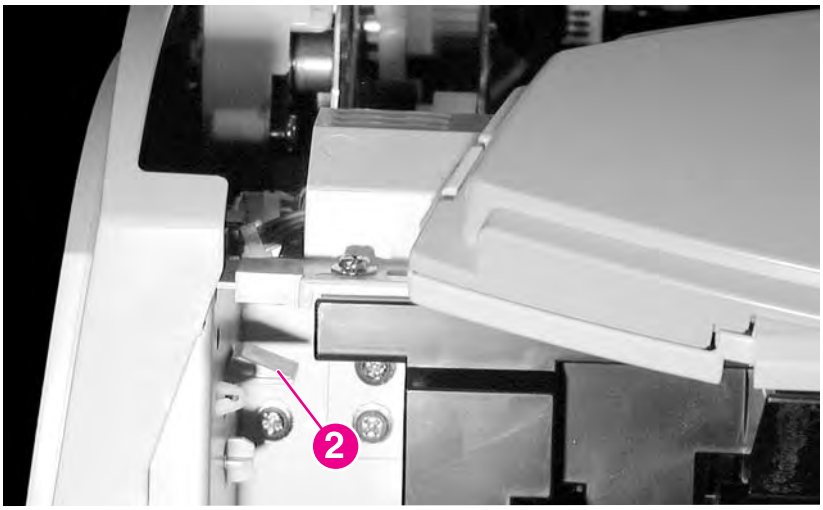


Figure 6-9 Remove the left cover (2 of 2)

3 Tilt the top of the cover away from the printer and remove it.

Reinstallation tip When reinstalling the left cover, be sure to insert the two hooks that are along the bottom edge of the cover into the holes in the printer chassis.

Right cover

1 Remove the following assemblies:

- Rear cover. See Rear cover.
- Top cover. See Top cover.
- Rear top cover. See Rear top cover.

2 Open the front cover.

3 Remove one screw (callout 1) and disengage the two locking tabs (callout 2).

4 Tilt the top of the right cover away from the printer and remove it.

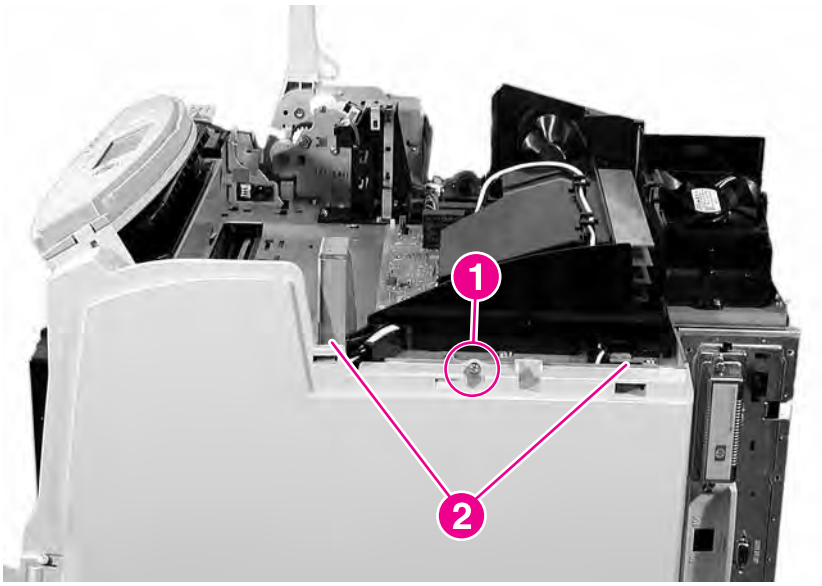


Figure 6-10 Remove the right cover

Reinstallation tip When reinstalling the right cover, be sure to insert the two hooks that are along the bottom edge of the cover into the holes in the chassis.

Multipurpose tray (tray 1)

1. Remove tray 2 from the printer and set it aside.
2. Unhook the two link arms (callout 1).
3. Flex the tray inward near the two link arms, and remove the tray.

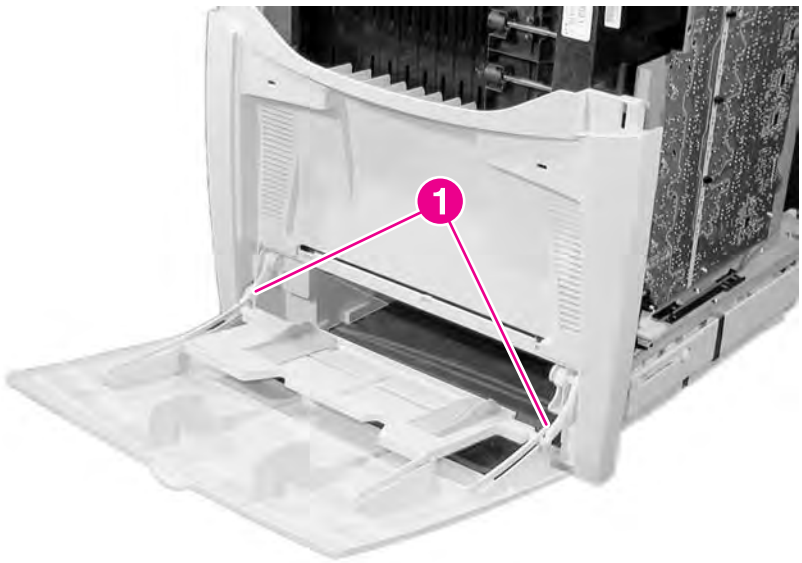


Figure 6-11 Remove the multipurpose tray

Front cover

1 Remove the multipurpose tray. See Multipurpose tray (tray 1).

2 Unhook the two spring rods (callout 1) from the slots (callout 2) on both sides of the printer.

CAUTION Spring tension holds the rods in place. Use caution when removing them. Tilt the tray up slightly to lessen the spring tension, which makes the rods easier to remove.

3 Press outward on the tray near the tray hinge pins and remove the cover.

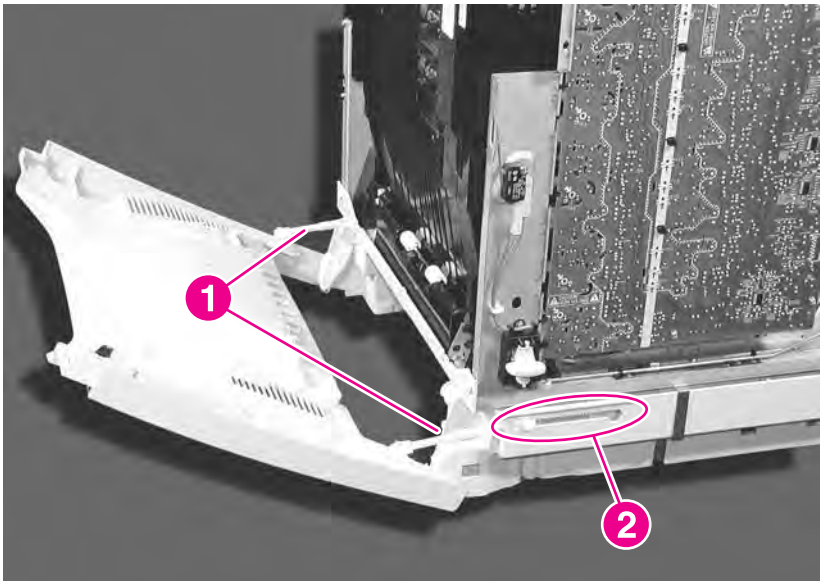


Figure 6-12 Remove the front cover

Reinstallation tip Make sure that the rods are engaged in the slots in the chassis (callout 2) when reinstalling the front cover.

Control panel

1 Open the top cover if you have not already removed it.

2 Remove three screws (callout 1).

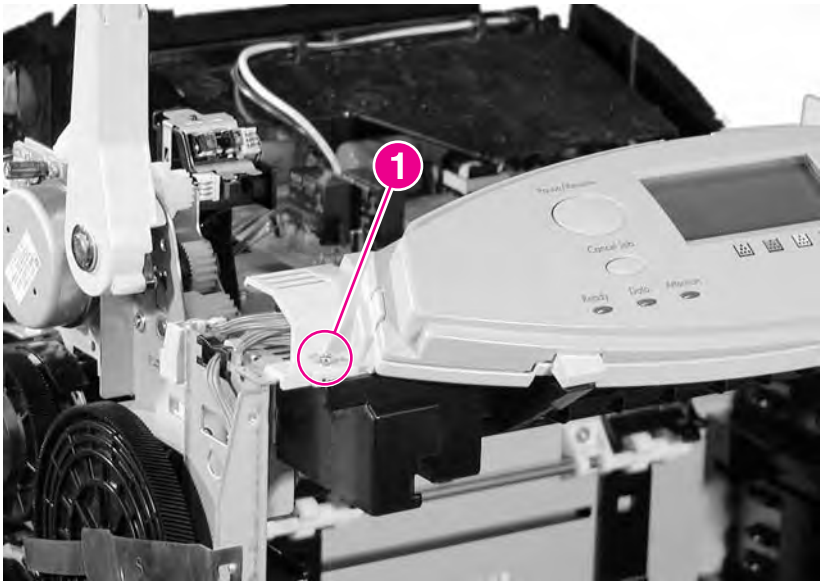


Figure 6-13 Remove the control panel (1 of 3)

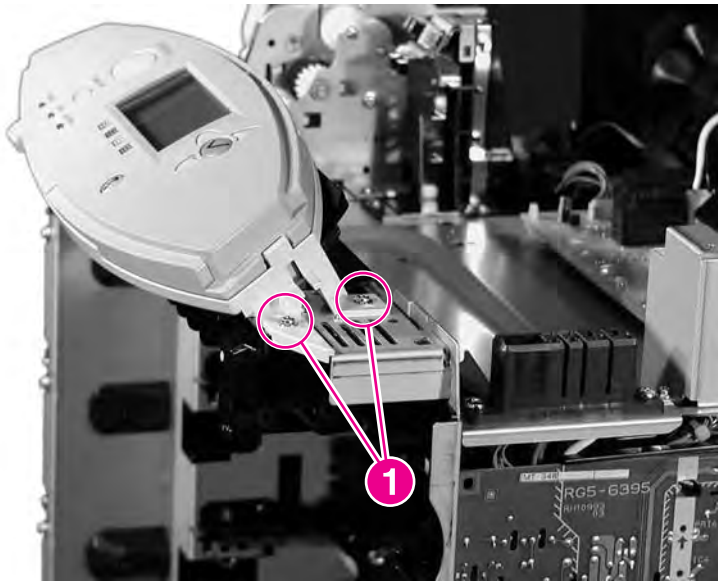


Figure 6-14 Remove the control panel (2 of 3)

3 Lift the right side of the control panel, disconnect one connector (callout 2), unwind the wires from the stay (callout 3), and remove the control panel.

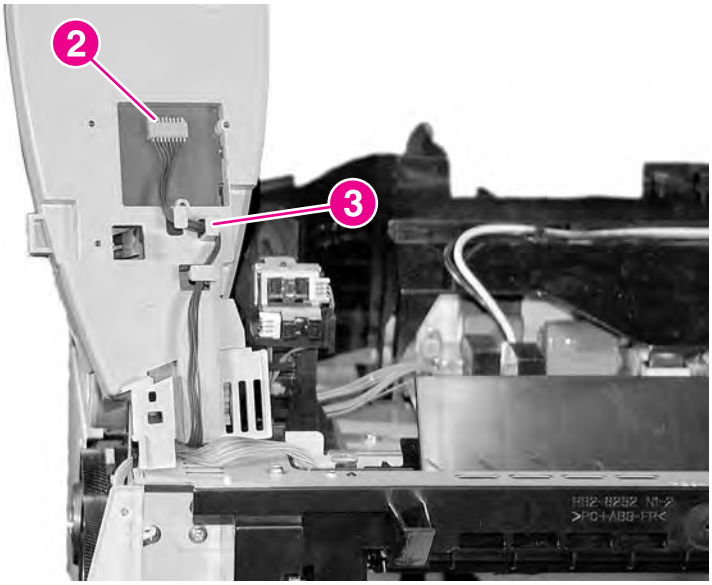


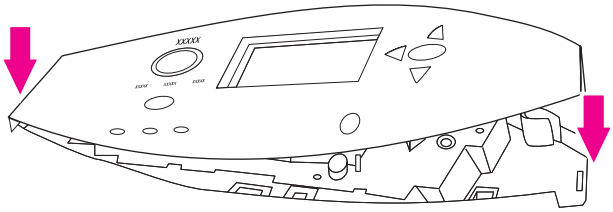
Figure 6-15 Remove the control panel (3 of 3)

Installing a new overlay (HP Color LaserJet 4600 models)

NOTE The HP Color LaserJet 4610n printer control panel is available in English only. You do not need to install an overlay or a label for this model. For the HP CLJ 4650 models, see Installing a new control-panel label (HP Color LaserJet 4650 models).

Some printer models are shipped without the control panel overlay installed or you might prefer using a different overlay from the one that is installed. Overlays are available for several languages, and you can change the language for control-panel messages. If you are setting up a printer for a language other than English, follow this procedure.

1. Open the top cover. Use a small flat-blade screwdriver to release the locking tabs on both sides of the control-panel overlay, and then remove the overlay.
2. Position the new overlay over the top of the control panel. Insert the left tab of the overlay into the slot on the printer face. Line up the tab on the right side of the overlay with the slot on the right side of the control panel. Set the overlay in place by pushing down on the overlay near the blue button.



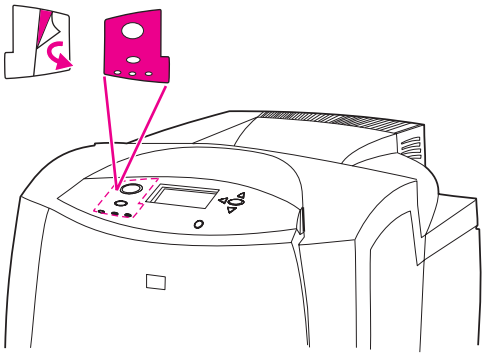
3. Press ✓ to open the **MENUS**.
4. Press ▼ to highlight **CONFIGURE DEVICE**.
5. Press ✓ to select **CONFIGURE DEVICE**.
6. Press ▼ to highlight **SYSTEM SETUP**.
7. Press ✓ to select **SYSTEM SETUP**.
8. Press ▼ to highlight **LANGUAGE**.
9. Press ✓ to select **LANGUAGE**.
10. Press ▼ to highlight the approriate language, and then press ✓ to select and save the language choice.

Installing a new control-panel label (HP Color LaserJet 4650 models)

NOTE The HP Color LaserJet 4610n printer control panel is available in English only. You do not need to install an overlay or a label for this model. For the HP CLJ 4600 models, see Installing a new overlay (HP Color LaserJet 4600 models).

Some printer models are shipped without the control panel labels installed or you might prefer using a different label from the one that is installed. Labels are available for several languages, and you can change the language for the control-panel messages. If you are setting up a printer for a language other than English, follow this procedure.

1. Remove the backing from the adhesive side of the label.
2. Position the new label over the top of the control panel.
3. Press the label firmly down onto the control panel.



NOTE When applying the label, start at the center and press the label into place towards the edges of the control panel.

4. Press MENU to open the **MENUS**.
5. Press ▼ to highlight **CONFIGURE DEVICE**.
6. Press ✓ to select **CONFIGURE DEVICE**.
7. Press ▼ to highlight **SYSTEM SETUP**.
8. Press ✓ to select **SYSTEM SETUP**.
9. Press ▼ to highlight **LANGUAGE**.
10. Press ✓ to select **LANGUAGE**.
11. Press ▼ to highlight the appropriate language, and then press ✓ to select and save the language choice.

Internal components

The following procedures explain the removal and replacement of internal components

DC controller shield

1 Remove the following assemblies:

- Print cartridges and ETB. See Print cartridges and ETB.
- Rear cover. See Rear cover.
- Top cover. See Top cover.
- Rear top cover. See Rear top cover.
- Left cover. See Left cover.

2 Remove nine screws (callout 1). A tenth screw might be located on the rear of the printer at the bottom of the DC controller shield (callout 2). If that tenth screw is present, remove it.

3 Remove the DC controller shield.

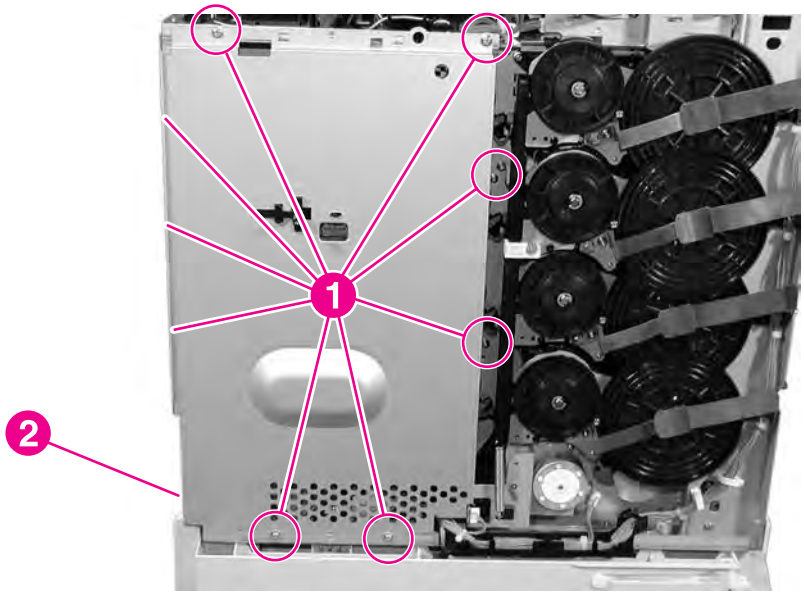


Figure 6-16 Remove and replace the DC controller shield

Internal components (front)

The following procedures explain the removal and replacement of internal components that are accessed from the front of the printer.

Paper pickup unit

1. Remove the DC controller shield. See DC controller shield.
2. Use a screwdriver to rotate the ETB latch receptacles up. They are stiff and might be difficult to move.
3. Remove two screws (callout 1).

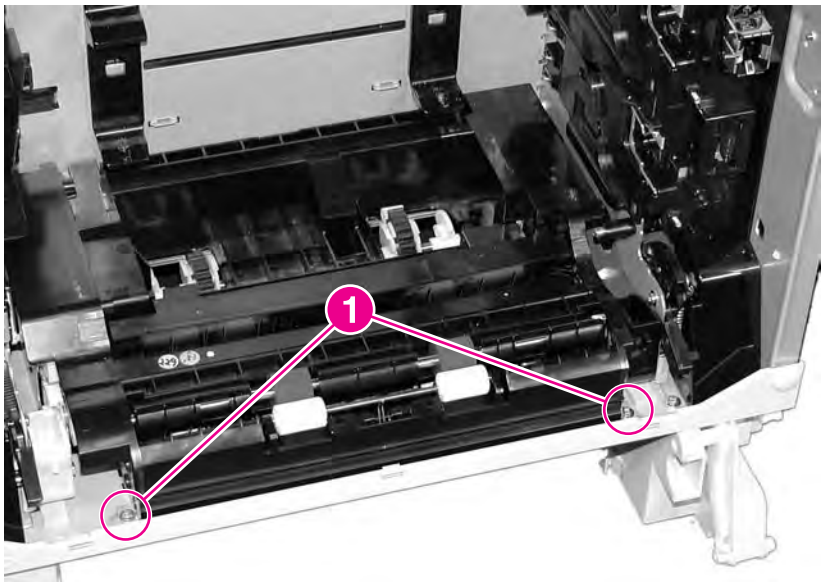


Figure 6-17 Remove the paper pickup unit (1 of 2)

4 Disconnect the connector (J1020 on the DC controller; callout 2) and push the connector through the hole in the chassis (callout 3).

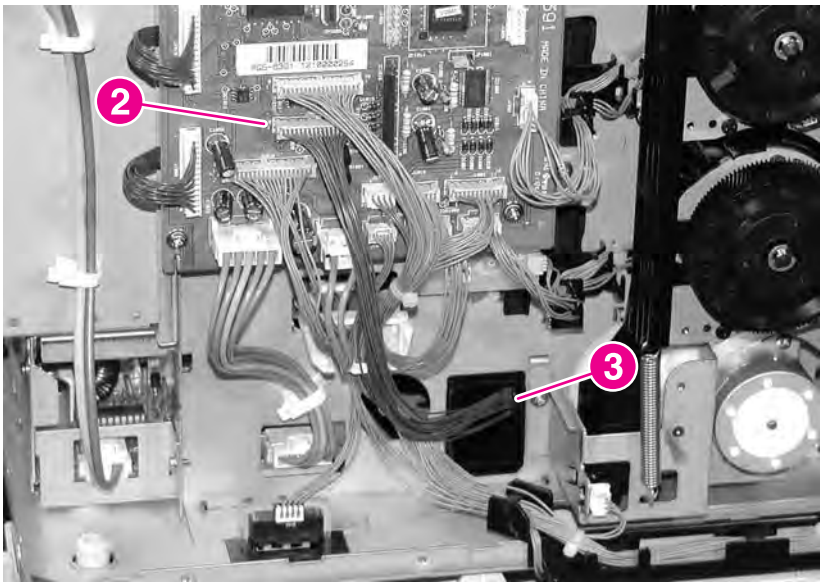


Figure 6-18 Remove the paper pickup unit (2 of 2)

5 Lift the paper pickup unit up and pull it forward to remove it.

Paper pickup sensor PCA

1. Remove the paper pickup unit. See Paper pickup unit.
2. Push in on the black tab (callout 1) on the right side of the paper pickup unit and then remove the sensor cover.
3. Remove three screws (callout 2), disconnect the connector (callout 3), and then remove the sensor PCA.

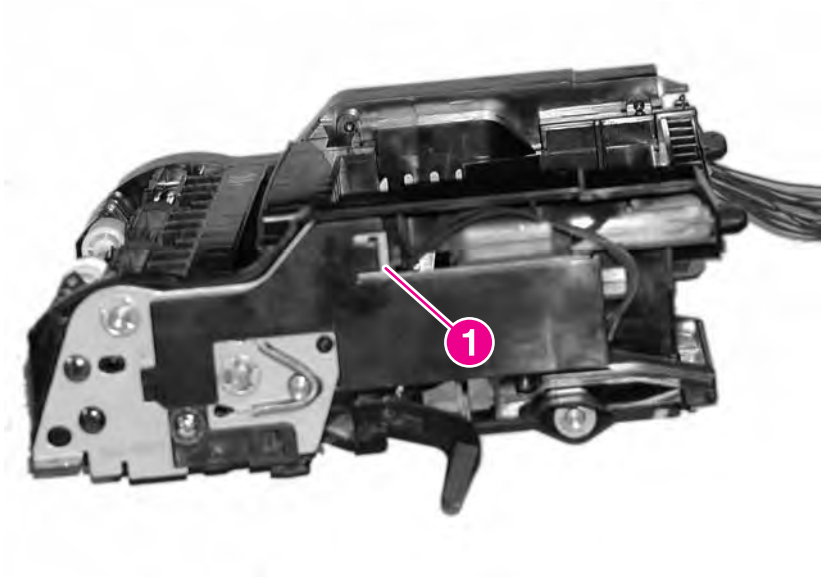


Figure 6-19 Remove the paper pickup sensor PCA (1 of 2)

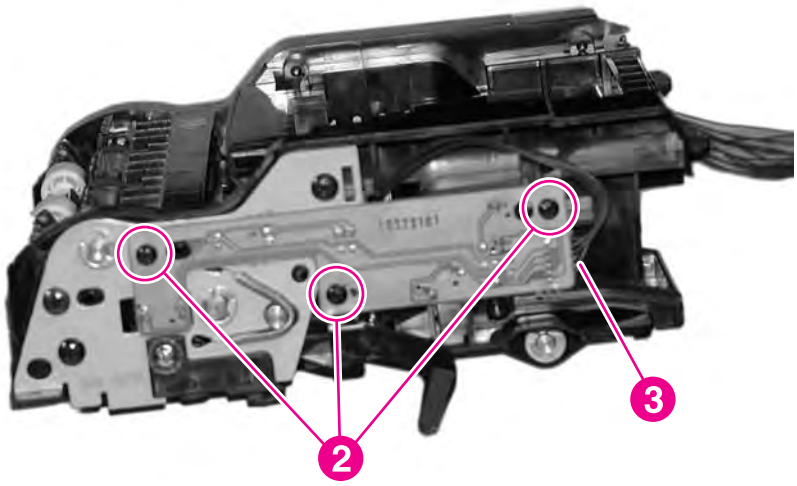


Figure 6-20 Remove the paper pickup sensor PCA (2 of 2)

Cassette (tray 2) paper pickup rollers

1 Remove the following assemblies:

- Print cartridges and ETB. See Print cartridges and ETB.
- Paper pickup unit. See Paper pickup unit.

2 From the bottom of the paper pickup unit, firmly push down on the paper pickup rollers (callout 1) to remove them.

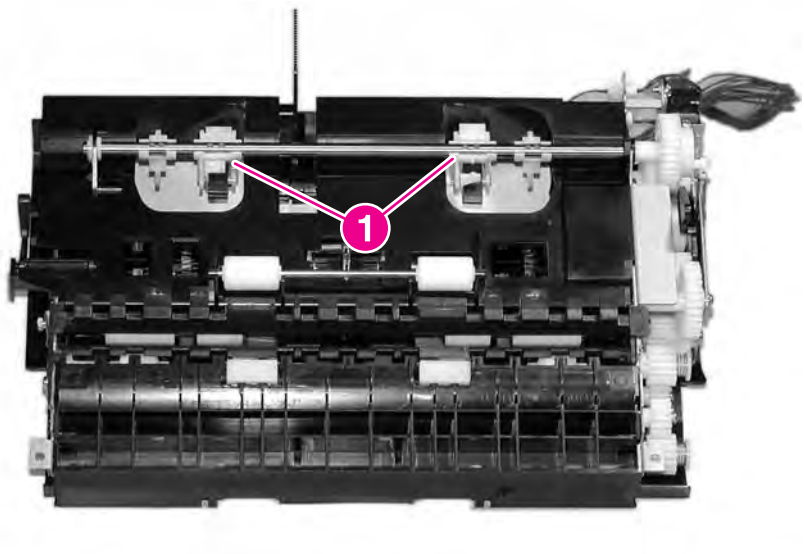


Figure 6-21 Remove the cassette (tray 2) pickup rollers

Reinstallation tip When reinstalling the paper pickup rollers, be sure to fit the pins on the pickup roller into the holes on the pickup-roller shaft.

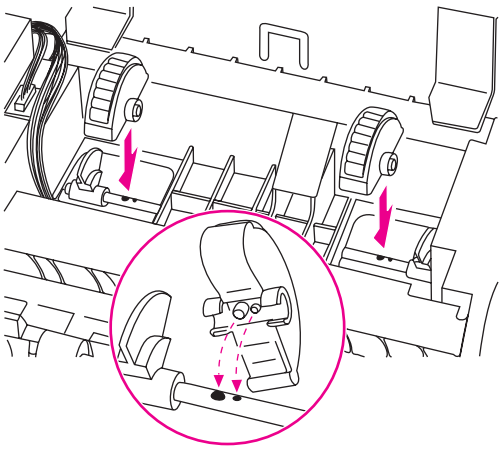


Figure 6-22 Reinstall the tray 2 pickup rollers

Paper pickup drive unit

1. Remove the paper pickup unit. See Paper pickup unit.
2. On the bottom of the paper pickup unit, remove the screw holding the gear cover in place, and then remove the gear cover.
3. Unhook the spring from the gear (callout 1).
4. Using a flat-blade screwdriver, push down on the tab in the center of the gear (callout 2) to release it, and then remove the gear.
5. Remove three black screws (callout 3).
6. Disconnect the three connectors on the back of the paper pickup drive unit, and then remove the unit.

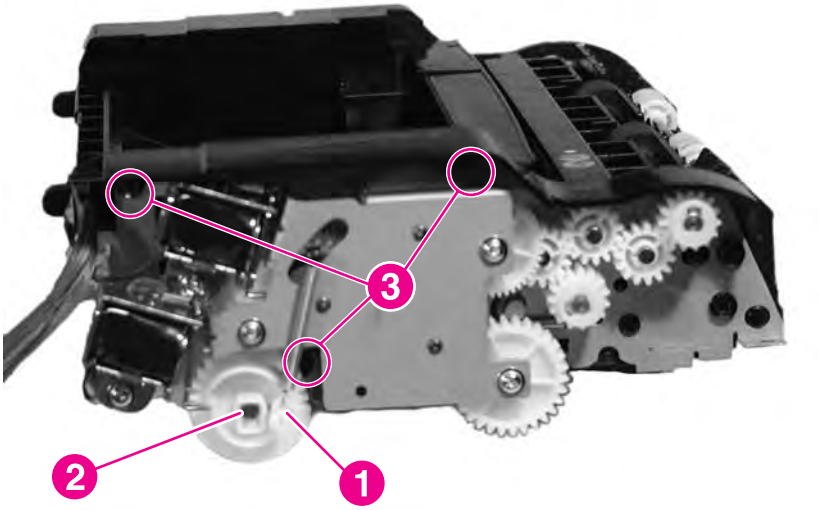


Figure 6-23 Remove the paper pickup drive unit

Multipurpose tray pickup roller and separation pad

1. Remove tray 2 from the printer, and remove any paper in the tray.
2. Rotate the two lock pins outward (callout 1), and tilt the cassette cover forward to remove it.
3. Push the blue roller (callout 2) towards the back of the tray, and remove it.

NOTE The locking pins are not captive. Do not lose them when the tray cover is removed.

4. Pull up on the multipurpose tray pickup roller (callout 3), and remove it.
5. Push outward on the two tabs that hold the separation pad in place (callout 4).

6 Pull the separation pad forward to remove it (callout 5).

NOTE Always replace the separation pad when you replace the multipurpose tray pickup roller.

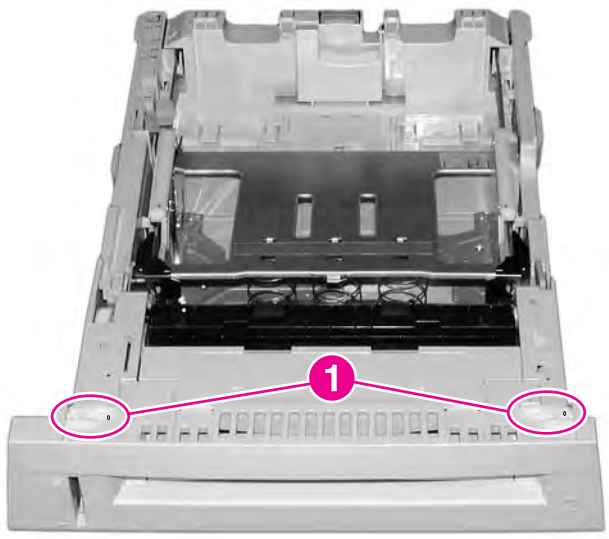


Figure 6-24 Remove the multipurpose tray pickup roller and separation pad (1 of 2)

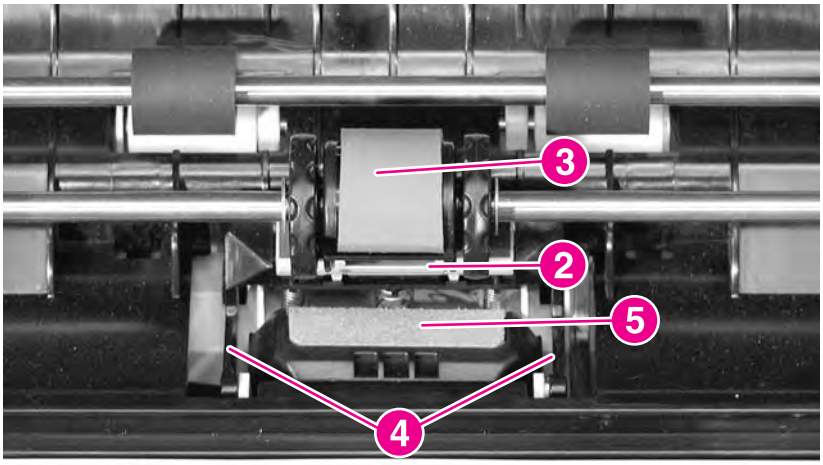


Figure 6-25 Remove the multipurpose tray pickup roller and separation pad (2 of 2)

Solenoids

1. Remove the paper pickup unit. See Paper pickup unit.
2. To remove the multipurpose tray solenoid, remove one screw (callout 1) and disconnect the connector (callout 2).
3. To remove the cassette solenoid, remove one screw (callout 3) and disconnect one connector (callout 4).

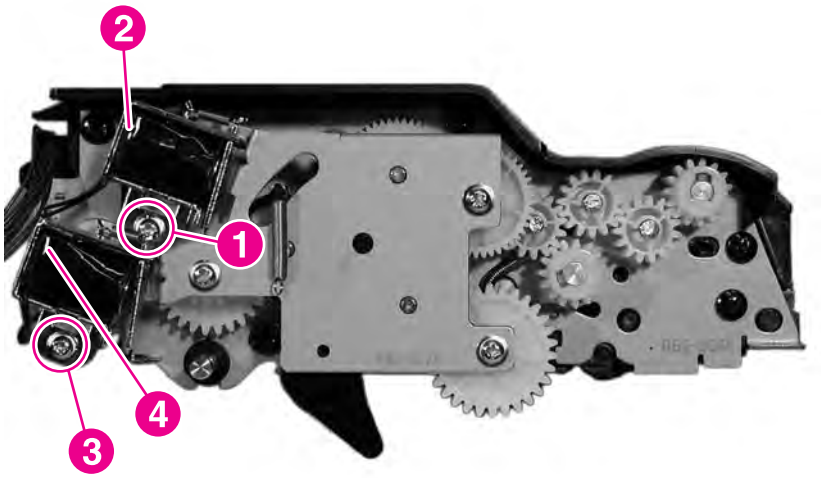


Figure 6-26 Remove the solenoids

Color registration detection unit

1. Open the top cover and the front cover.
2. Remove the ETB.

NOTE To protect the ETB from damage, always remove the ETB when removing the color registration detection unit.

3. Remove the control panel. See Control panel.
4. Disconnect one connector (callout 1).
5. Remove two screws (callout 2).
6. Remove one screw (callout 3). This screw is located on the right side of the printer, underneath the plate where the screws in callout 2 are located.

7 Remove the control panel support assembly (callout 4), and then remove the color registration detection unit, which is located behind the stay.

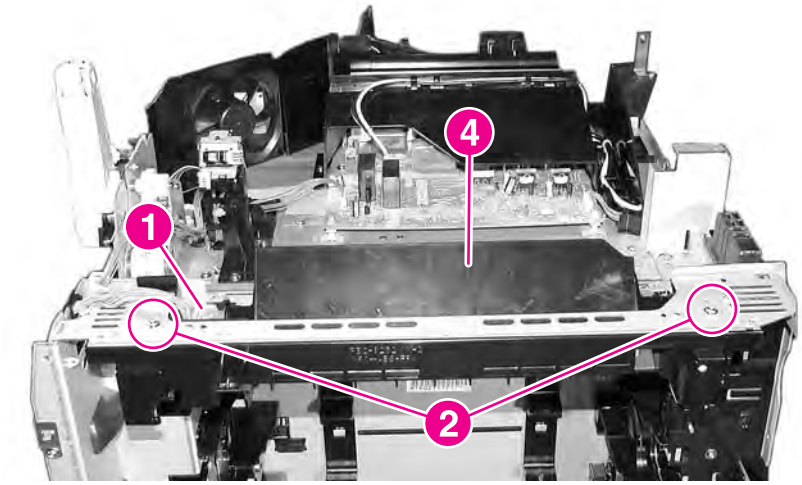


Figure 6-27 Remove the color registration detection unit (1 of 2)

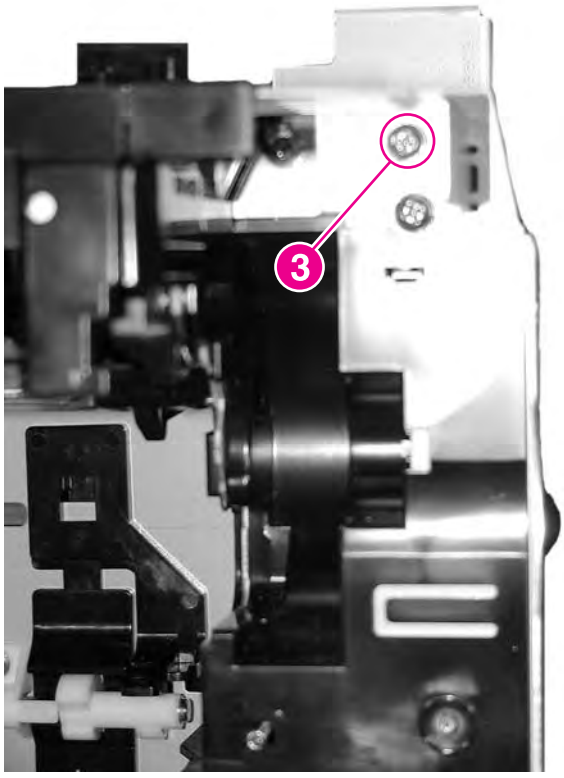


Figure 6-28 Remove the color registration detection unit (2 of 2)

Internal components (left side)

The following procedures explain the removal and replacement of internal components that are accessed from the left side of the printer.

Environment sensor (HP Color LaserJet 4610n/4650 models only)

1 Remove the following assemblies:

- Rear cover. See Rear cover.
- Top cover. See Top cover.
- Rear top cover. See Rear top cover.
- Left cover. See Left cover.
- DC controller shield. See DC controller shield.

2 Disconnect one connector (callout 1).

3 Release two locking tabs (callout 2) and then remove the environment sensor.

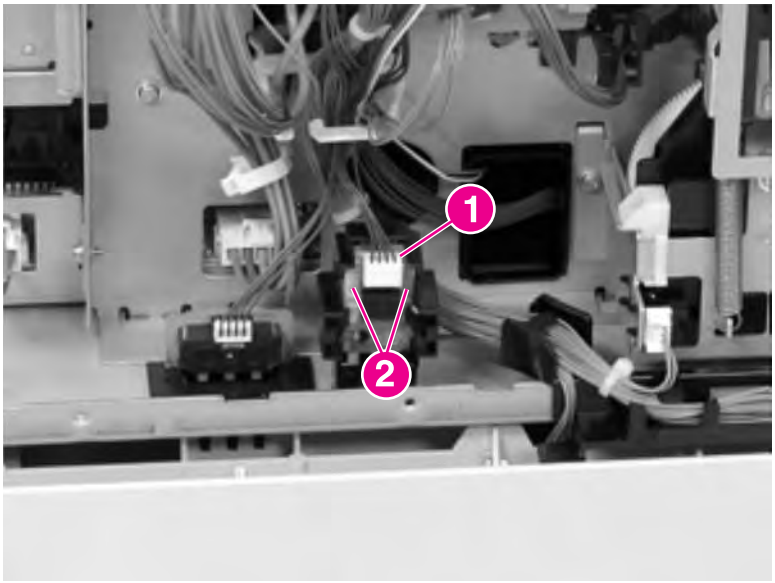


Figure 6-29 Remove the environment sensor

Drum drive units

Removing the drum drive units requires several distinct procedures.

Drum drive developing disengaging rod

1 Remove the following assemblies:

- Rear cover. See Rear cover.
- Top cover. See Top cover.
- Rear top cover. See Rear top cover.
- Left cover. See Left cover.
- DC controller shield. See DC controller shield.

2 Remove the five screws (callout 1), and then remove the drum drive grounding plate (callout 2) that covers the developing disengaging rod.

3 Unhook the spring (callout 3), and then slide the developing disengaging rod up and out.

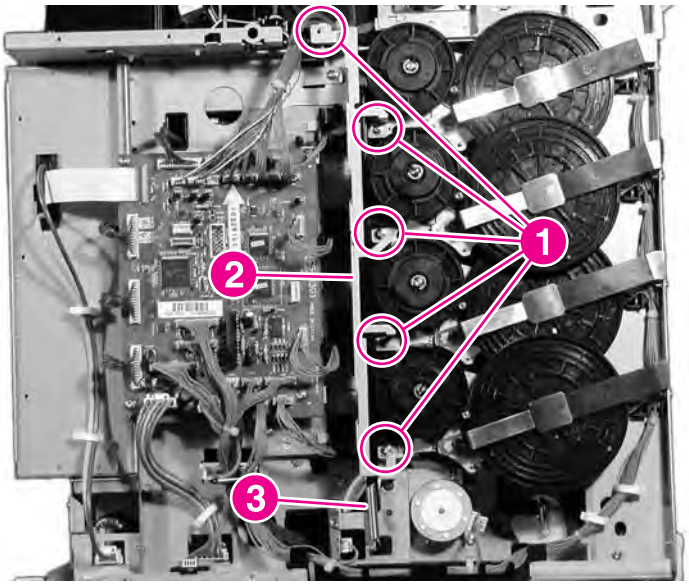


Figure 6-30 Remove the developing disengaging rod

Reinstalling the developing disengaging rod

1 When reinstalling the developing disengaging rod, be sure to rotate the white gear (located between the black and magenta drum-drive units) clockwise until it comes to a complete stop (callout 1).

You cannot rotate the white gear unless all of the print cartridges are removed.

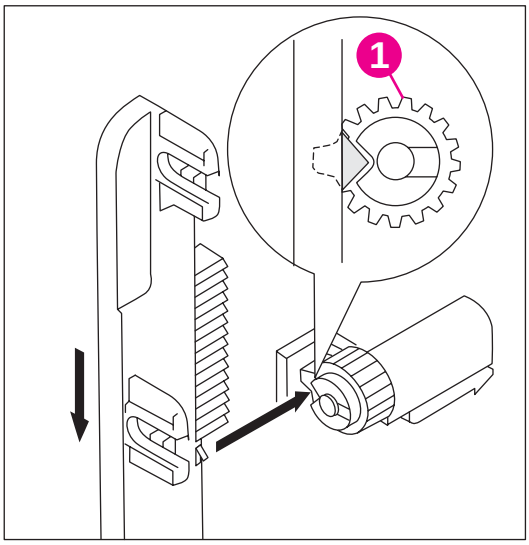


Figure 6-31 Reinstall the developing disengaging rod (1 of 2)

2 Also make sure that the developing disengaging rod passes through the slots in the drive clutches (in the up position; callout 2) in each of the four drum drive units, engaging each clutch. The clutch on the yellow drum drive unit is particularly difficult to see and to engage.

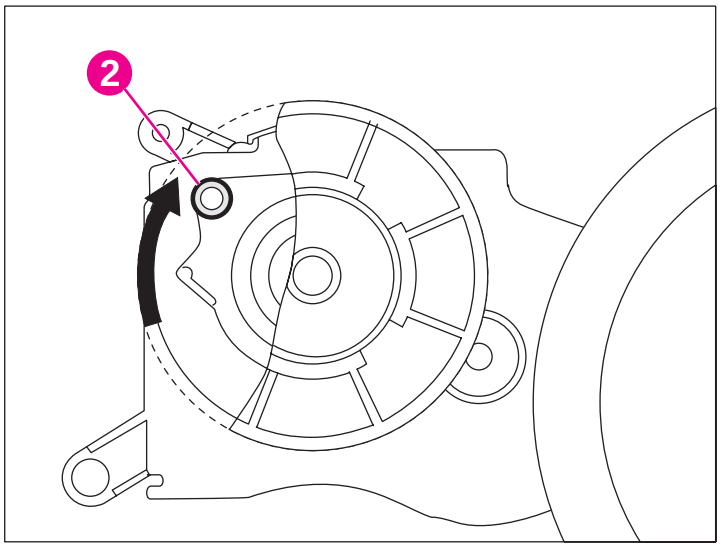


Figure 6-32 Reinstall the developing disengaging rod (2 of 2)

Drum drive gears

1 Remove the developing disengaging rod. See Drum drive developing disengaging rod.

2 Remove the eight screws shown in callout 1, and then remove the four drum-gear grounding plates.

NOTE The grounding plates and drive gears for the cyan and magenta drum drive units have longer shafts than those in the yellow and black drum drive units.

3 Remove the four drum drive gears (callout 2).

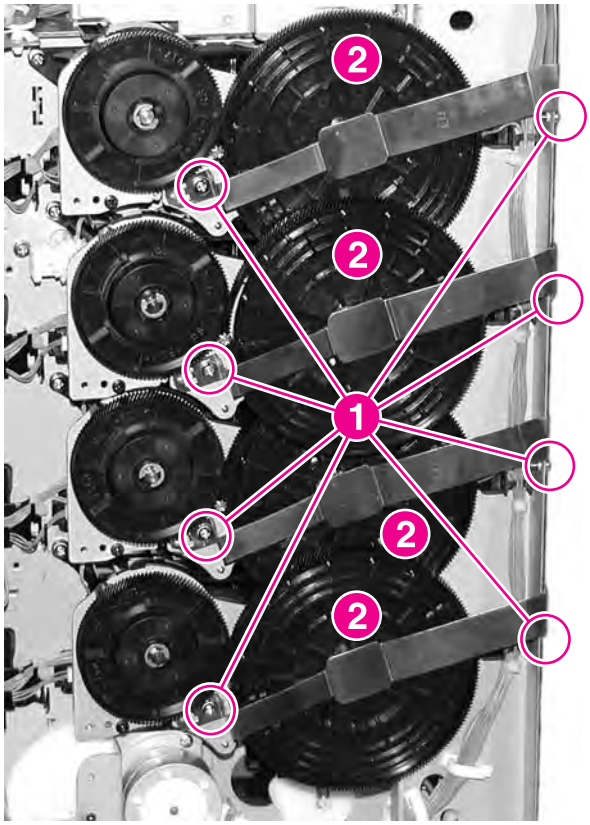


Figure 6-33 Remove the drum drive gears

NOTE Calibrate the printer after removing and replacing any of the drum drive gears. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).

Drum home-position sensors

1 Remove the drum drive gears. See Drum drive gears.

2 Disconnect four connectors (callout 1).

3 Push each drum home-position sensor holder (behind the connectors shown in callout 1) toward the rear of the printer, and flex it to remove the projection. Remove the sensor.

4 Disengage the two tabs that hold each drum home-position sensor in its holder, and then remove the sensors.

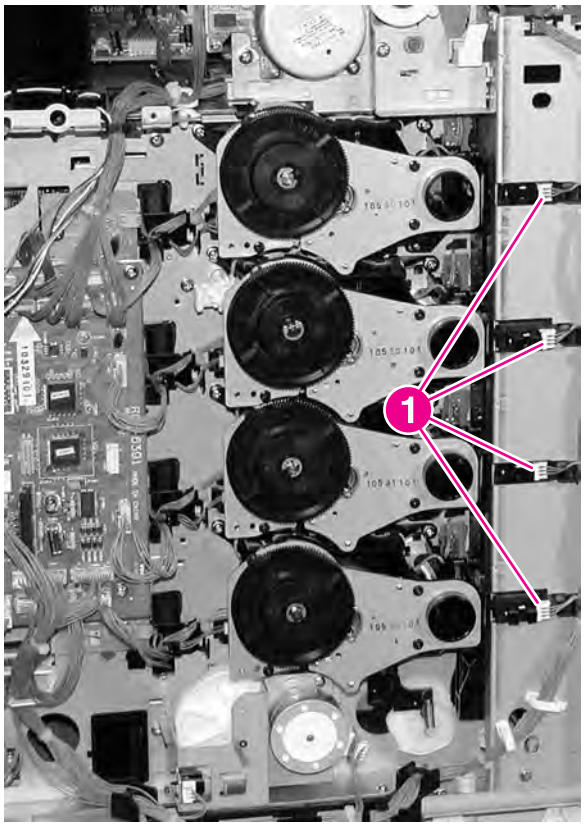


Figure 6-34 Remove the drum home-position sensors

NOTE Calibrate the printer after reassembling the drum drive position sensors. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).

Drum drive motors

1 Remove the drum drive gears. See Drum drive gears

2 From the front of the printer, release the tab that holds the black interlock cover (callout 1) in place, and then remove the interlock cover.

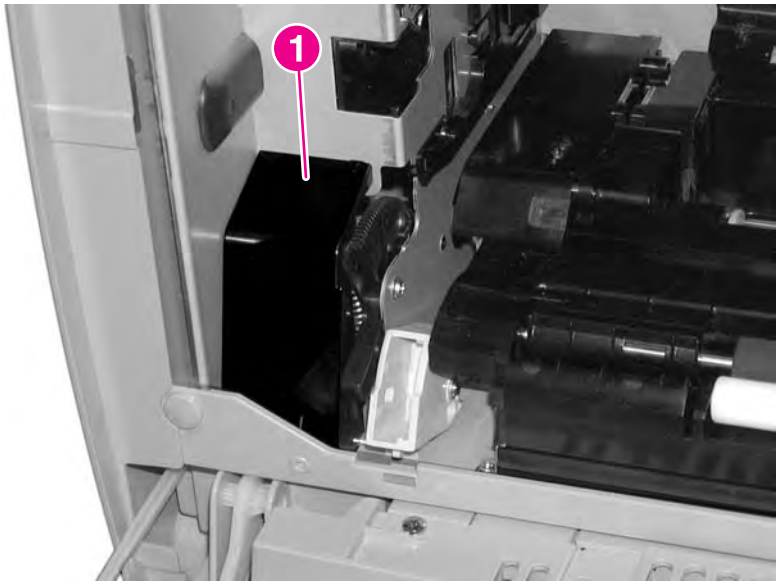


Figure 6-35 Remove the interlock cover

3 Remove the interlock arm from the interlock lever (callout 2).

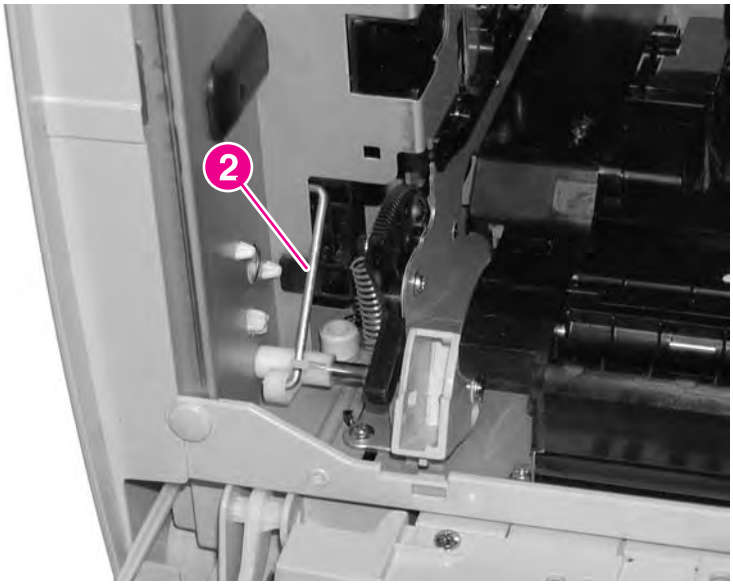


Figure 6-36 Remove the interlock arm

4 Lift the cartridge shutter bar (callout 3) up and out of the printer.

5 Remove four screws (callout 4). In the picture, the gear hides the screw in the upper-left corner.

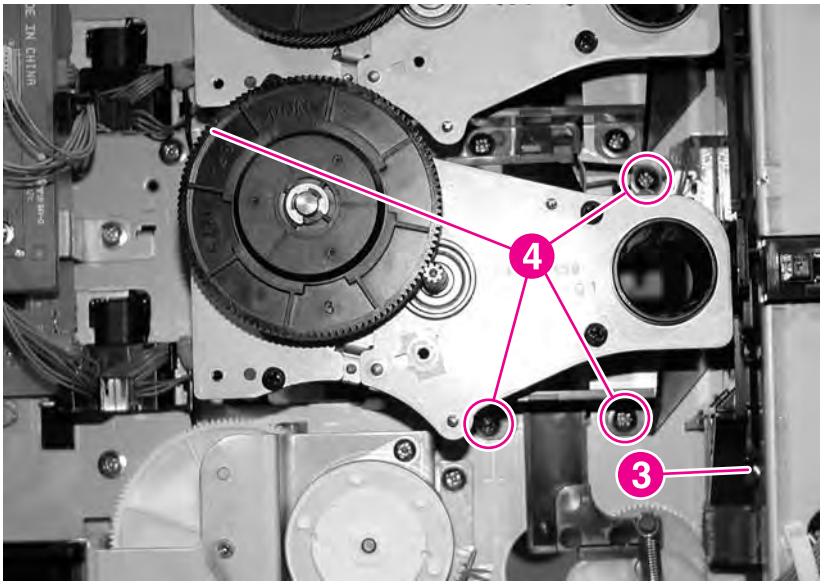


Figure 6-37 Remove the drum drive motors (cyan motor is shown)

6 Disconnect the connector for each drum drive motor from the DC controller PCA.

7 Remove the drum drive motors.

NOTE Calibrate the printer after reassembling the drum drive motors. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).

Memory-tag antenna PCAs

1. Remove the drum drive units. See Drum drive units.
2. Remove one screw (callout 1), and remove the grounding plate (callout 2).
3. Remove the white retainer (callout 3).
4. Disconnect the connector (callout 4) from the memory controller PCA.
5. Remove the memory-tag antenna PCA, which is inside the slot.

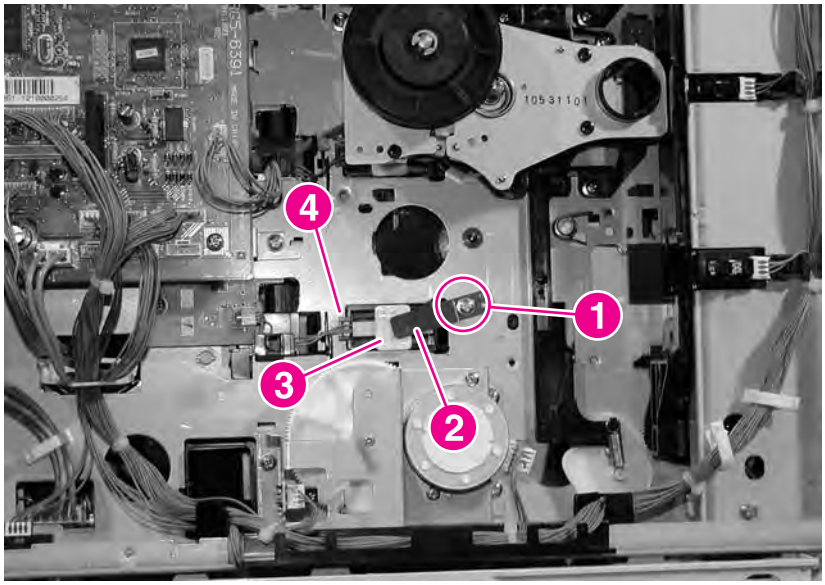


Figure 6-38 Remove the memory-tag antenna PCA (cyan is shown)

Developing disengaging motor assembly

1 Remove the following assemblies:

- Rear cover. See Rear cover.
- Top cover. See Top cover.
- Rear top cover. See Rear top cover.
- Left cover. See Left cover.
- DC controller shield. See DC controller shield.
- Developing disengaging rod. See Drum drive developing disengaging rod.

2 Remove three screws (callout 1).

3 Disconnect two connectors (callout 2).

4 Remove the developing disengaging motor assembly.

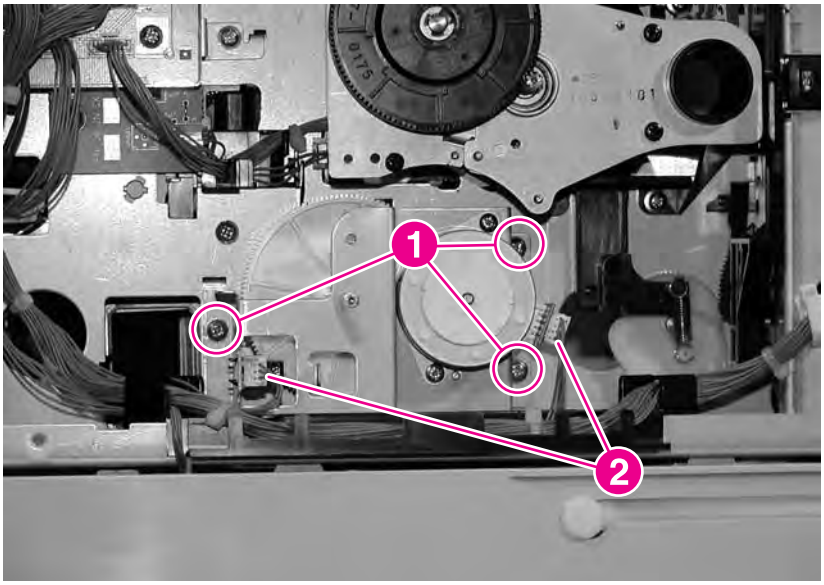


Figure 6-39 Remove the developing disengaging motor assembly

DC controller PCA

1 Remove the following assemblies:

- Rear cover. See Rear cover.
- Top cover. See Top cover.
- Rear top cover. See Rear top cover.
- Left cover. See Left cover.
- DC controller shield. See DC controller shield.

2 Remove four screws (callout 1).

3 Disconnect all of the connectors on the DC controller PCA, including the formatter ribbon cable (callout 2).

CAUTION When removing the formatter ribbon cable, be careful not to tear it or to damage the connector. Use a flat-blade screwdriver to release the brown tab over the connection. Do not pull on the ribbon cable without releasing this tab.

4 Remove the DC controller PCA.

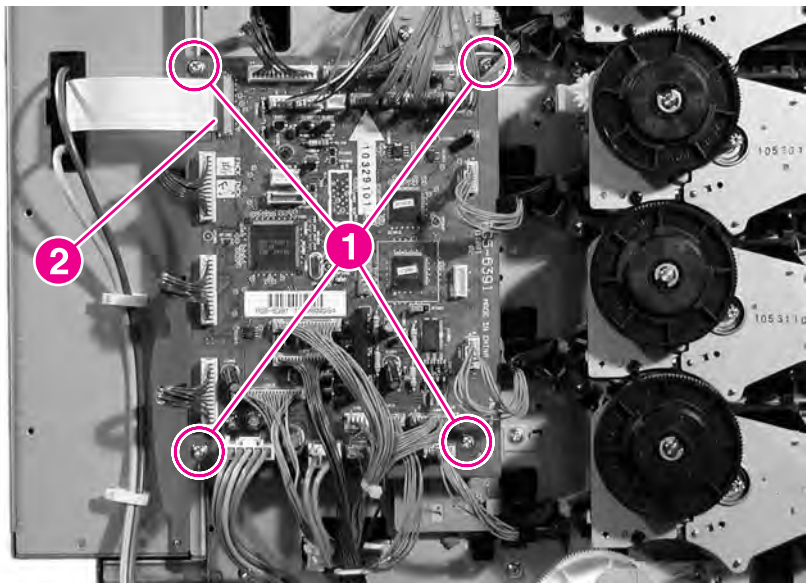


Figure 6-40 Remove the DC controller PCA

NOTE Calibrate the printer after reinstalling the DC controller PCA. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).

Memory controller PCA

1. Remove the DC controller PCA. See DC controller PCA.
2. Remove three screws (callout 1).
3. Disconnect five connectors (callout 2).
4. Remove the memory controller PCA.

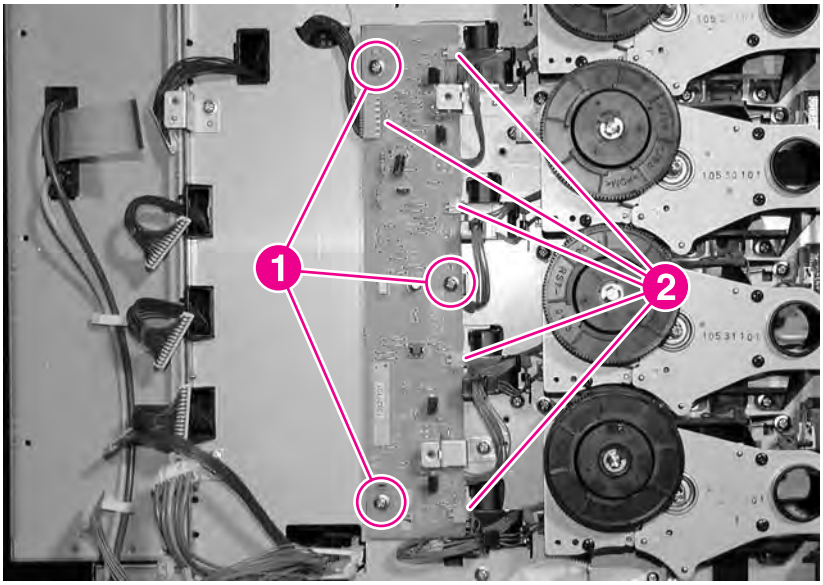


Figure 6-41 Remove the memory controller PCA

Cassette paper-size-detection switch

1 Remove the following assemblies:

- Rear cover. See Rear cover.
- Top cover. See Top cover.
- Rear top cover. See Rear top cover.
- Left cover. See Left cover.
- DC controller shield. See DC controller shield.

2 Disconnect one connector (callout 1).

3 Squeeze the two locking tabs (callout 2), and remove the cassette paper-size-detection switch.

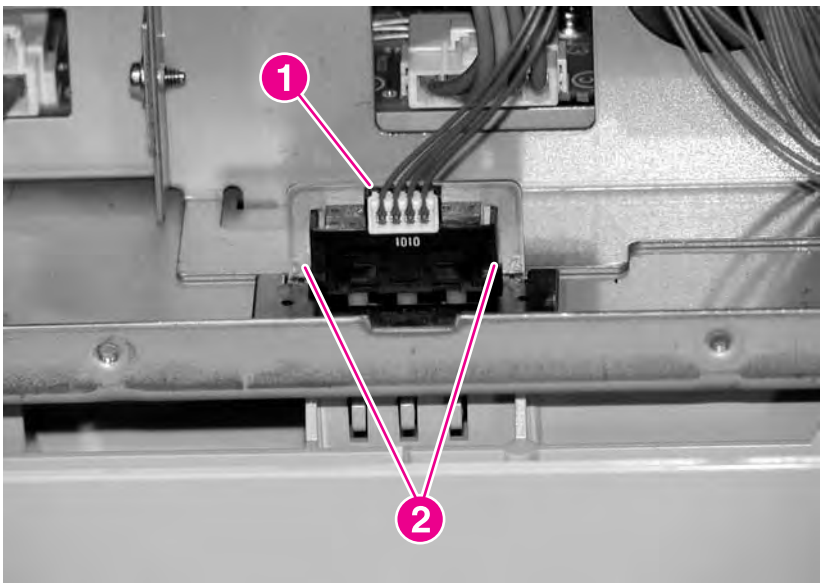


Figure 6-42 Remove the cassette paper-size-detection switch

Internal components (rear)

The following procedures explain the removal and replacement of internal components that are accessed from the rear of the printer.

Formatter

1 Remove eight screws (callout 1).

NOTE The formatter in Figure 6-43 Remove the formatter (HP Color LaserJet 4600 model is shown) is for the HP Color LaserJet 4600 model. The formatters for the HP Color LaserJet 4610n and 4650 models have different connectors, but the eight screws are in the same location.

2 Grasp the black disk-drive lock (callout 2), and pull the formatter out of the printer.

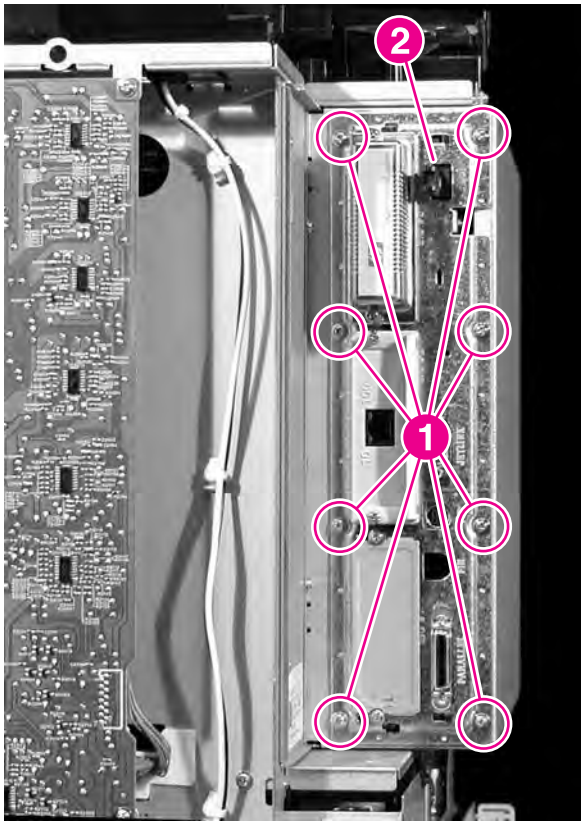


Figure 6-43 Remove the formatter (HP Color LaserJet 4600 model is shown)

NOTE Calibrate the printer after reinstalling the formatter. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).

Low-voltage power supply

1 Remove the following assemblies:

- Rear cover. See Rear cover.
- Top cover. See Top cover.
- Rear top cover. See Rear top cover.
- Left cover. See Left cover.
- DC controller shield. See DC controller shield.
- Right cover. See Right cover.

2 Remove two screws (callout 1).

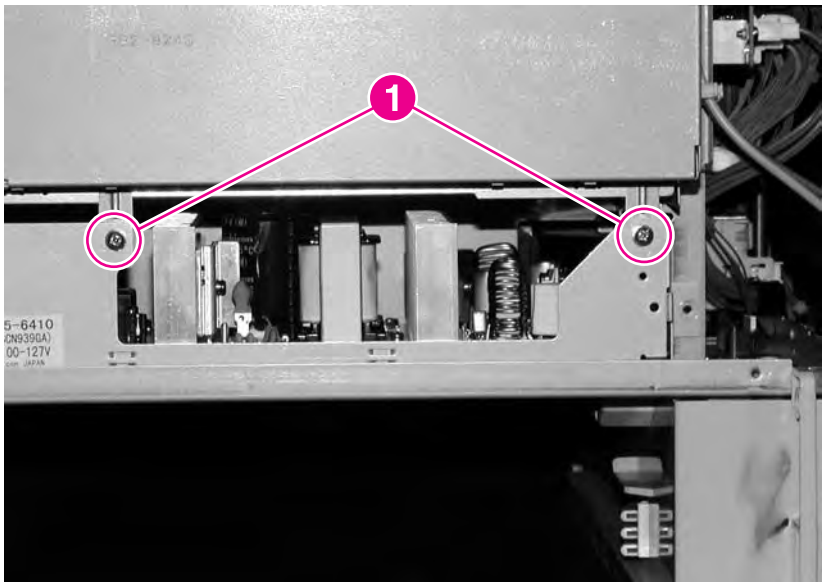


Figure 6-44 Remove the low-voltage power supply (rear) (1 of 3)

3 Remove two screws (callout 2) and then disconnect the connecting rod (callout 3).

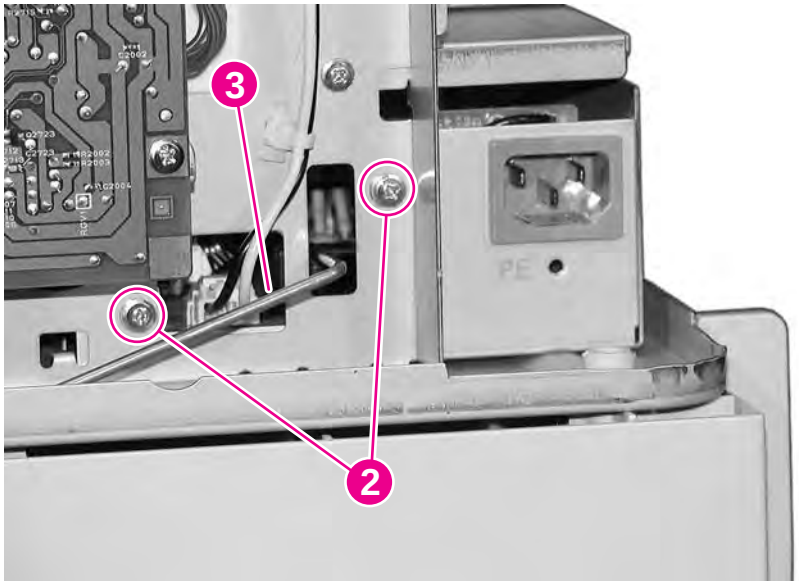


Figure 6-45 Remove the low-voltage power supply (2 of 3)

4 Remove one screw (callout 4) and then disconnect the two connectors (callout 5).

5 Remove the low-voltage power supply.

> **CAUTION** When removing the low-voltage power supply, be sure that elements do not touch sheet metal.

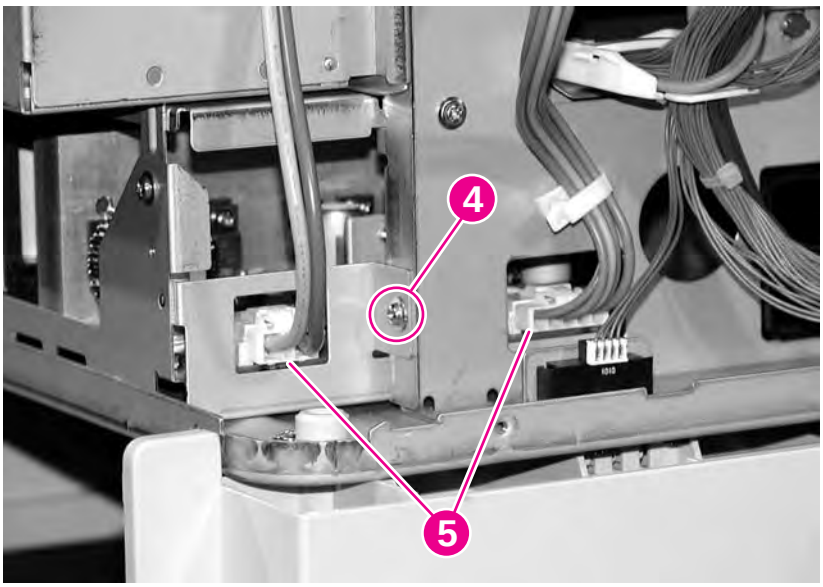


Figure 6-46 Remove the low-voltage power supply (left side) (3 of 3)

Power-supply fan (HP Color LaserJet 4610n and 4650 models)

1 Remove the following assemblies:

- Rear cover. See Rear cover.
- Top cover. See Top cover.
- Rear top cover. See Rear top cover.
- Left cover. See Left cover.
- DC controller shield. See DC controller shield.
- Right cover. See Right cover.
- Low-voltage power supply. See Low-voltage power supply.

2 Disconnect on connector from the DC controller PCA (callout 1).

3 Remove the wire from the wire guide, and pass the wire through the hole in the chassis (callout 2).

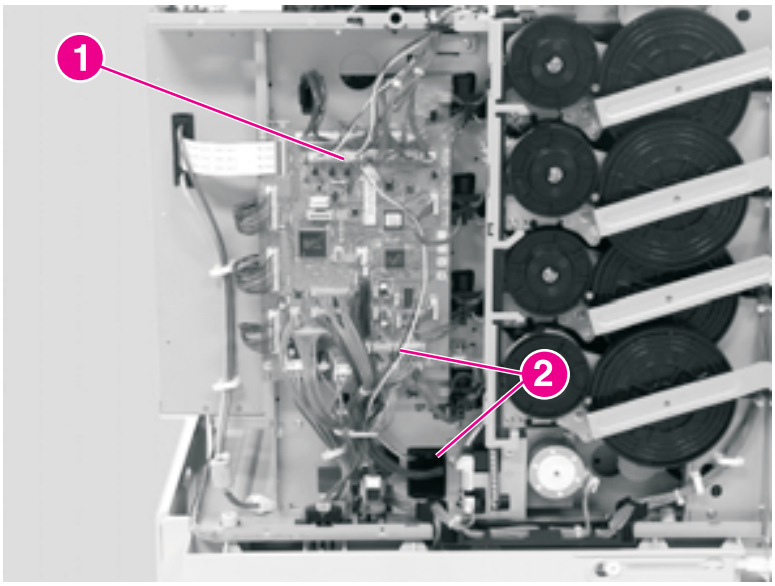


Figure 6-47 Remove the power-supply fan (1 of 2; HP Color LaserJet 4610n and 4650 models)

4 Release the locking tabs on the fan and remove the power-supply fan (callout 3).

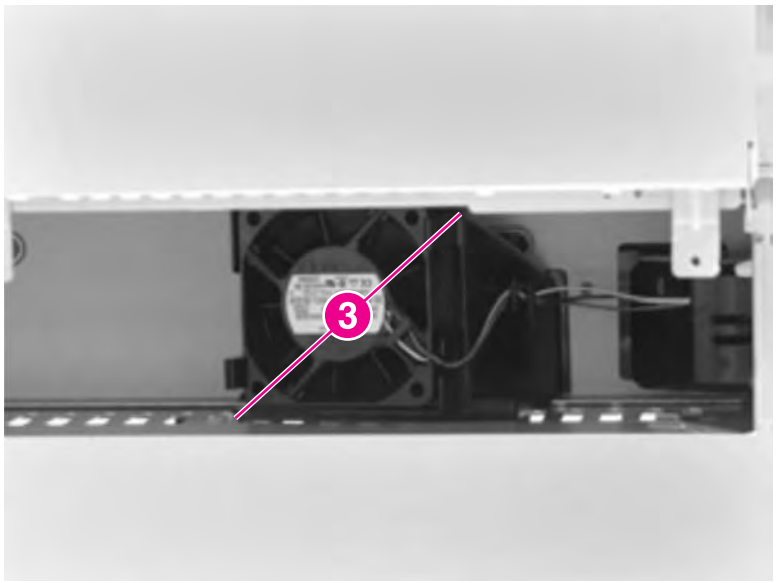


Figure 6-48 Remove the power-supply fan (2 of 2; HP Color LaserJet 4610n and 4650 models)

Formatter case

1 Remove the following assemblies:

- Rear cover. See Rear cover.
- Top cover. See Top cover.
- Rear top cover. See Rear top cover.
- Left cover. See Left cover.
- DC controller shield. See DC controller shield.
- Right cover. See Right cover.

2 At the rear of the printer, remove eight screws (callout 1).

3 On the DC controller PCA, release the brown tab covering the formatter ribbon cable, and disconnect the cable (callout 2).

CAUTION When removing the formatter ribbon cable, be careful not to tear it. Use a flat-blade screwdriver to release the brown tab over the connection. Do not pull on the ribbon cable without releasing this tab.

4 Disconnect one connector (callout 3), and remove the formatter case.

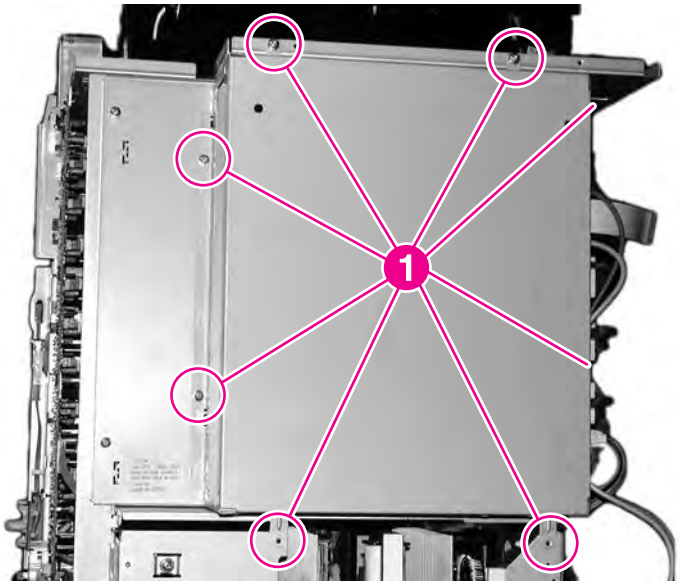


Figure 6-49 Remove the formatter case (1 of 2)

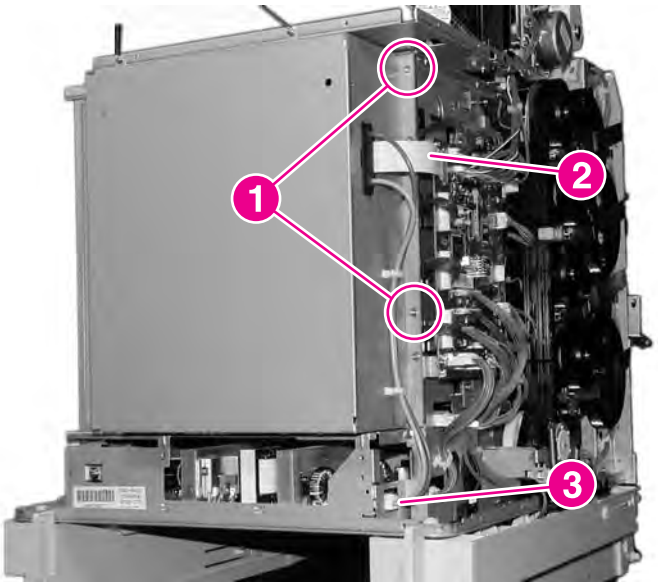


Figure 6-50 Remove the formatter case (2 of 2)

Laser/scanner components

Removing the laser/scanner assembly requires several distinct procedures.

Remove the laser/scanner cover plate

1 Remove the following assemblies:

- Rear cover. See Rear cover.
- Top cover. See Top cover.
- Rear top cover. See Rear top cover.
- Left cover. See Left cover.
- DC controller shield. See DC controller shield.
- Right cover. See Right cover.

2 On the DC controller PCA, disconnect four connectors (callout 1).

3 On the DC controller PCA, release the brown tab covering the formatter ribbon cable, and disconnect the cable (callout 2).

> **CAUTION** When removing the formatter ribbon cable, be careful not to tear it. Use a flat-blade screwdriver to release the brown tab over the connection. Do not pull the ribbon cable without releasing this tab.

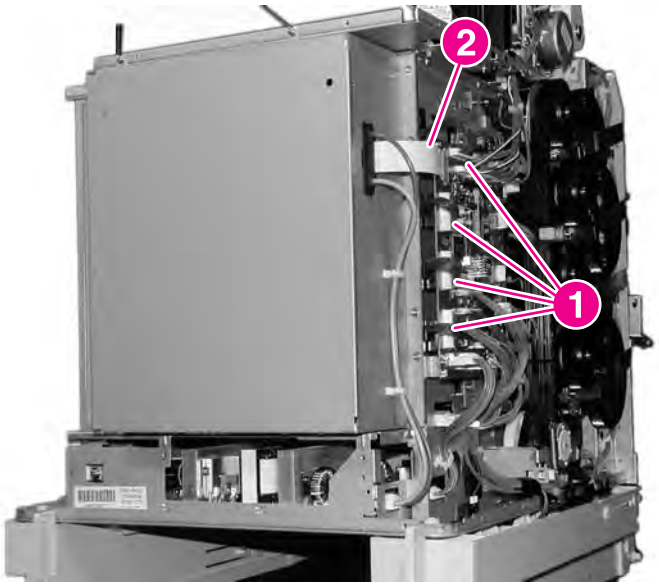


Figure 6-51 Disconnect the laser/scanner connectors and formatter ribbon cable

4 Remove the formatter case. See Formatter case.

5 At the rear of the printer, place the cardboard spacer (included with the laser/scanner assembly) underneath the V mark on the bottom of the chassis (callout 3).

CAUTION Always place the spacer under the chassis. This spacer supports the printer and keeps it from flexing when the plate that covers the laser/scanner units is removed. If the chassis flexes, the laser beams can become skewed, resulting in print-quality problems.

6 Remove four screws (callout 4).

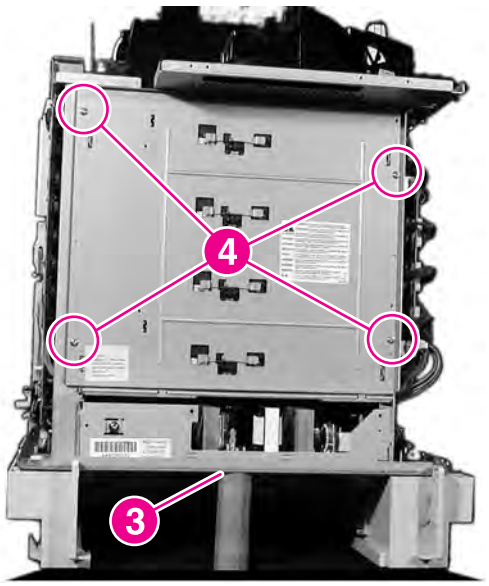


Figure 6-52 Remove the laser/scanner cover plate (1 of 2)

7 Using needle-nose pliers, pull down on the right side of the wire clip, then release the left side of the clip from the bracket. Repeat this step for each of the four clips.

8 Remove the plate that covers the laser/scanner units.

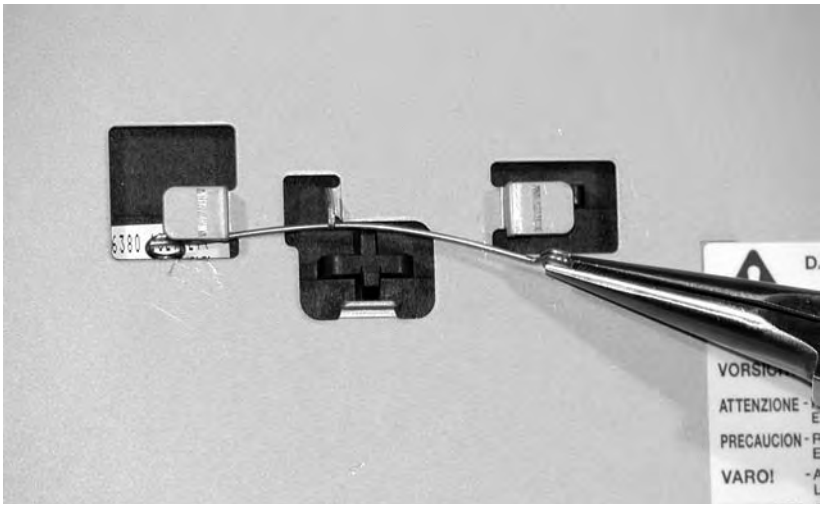


Figure 6-53 Remove the laser/scanner cover plate (2 of 2)

Reinstallation tip When reinserting the four wire clips, insert the left end of the clip first, thread the clip under the center notch, and then insert the right end of the clip.

Remove the laser/scanner retaining bars

1 Remove the laser/scanner cover plate. See Remove the laser/scanner cover plate.

2 Pull the cables for the four laser/scanner connectors free of the printer chassis.

3 On the left side of the printer, remove one screw above the DC controller (callout 1).

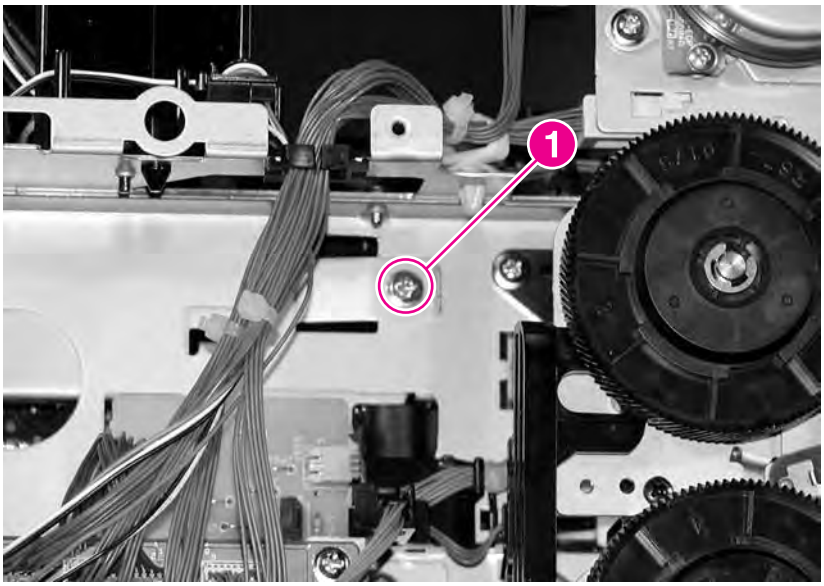


Figure 6-54 Remove the left side laser/scanner retaining bar (1 of 2, left side of printer)

4 Push the top of the sheet-metal scanner retaining bar towards the laser/scanner units (callout 2).

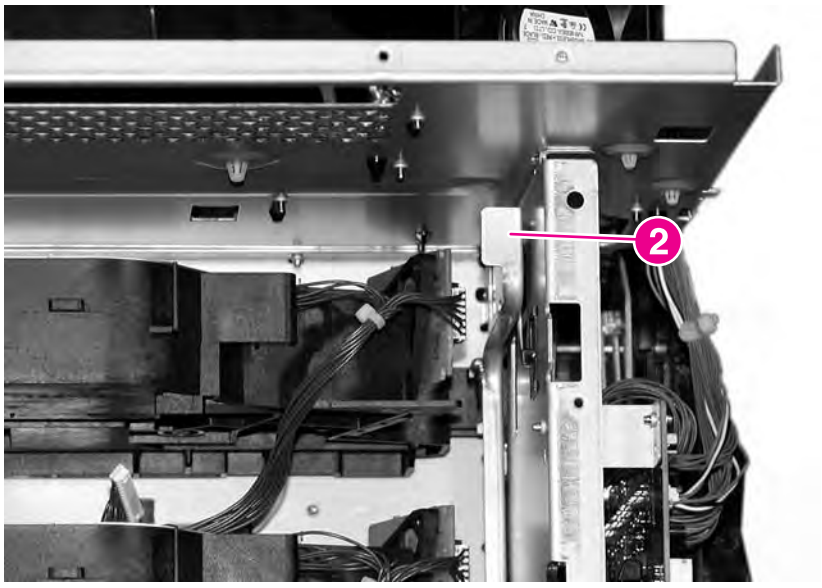


Figure 6-55 Remove the left side laser/scanner retaining bar (2 of 2, rear of printer)

5 Rotate the bar down and carefully remove it from the printer.

CAUTION The scanner retaining bars are under spring tension. Remove them carefully.

6 On the top surface of the right side of the printer, remove one screw (callout 3).

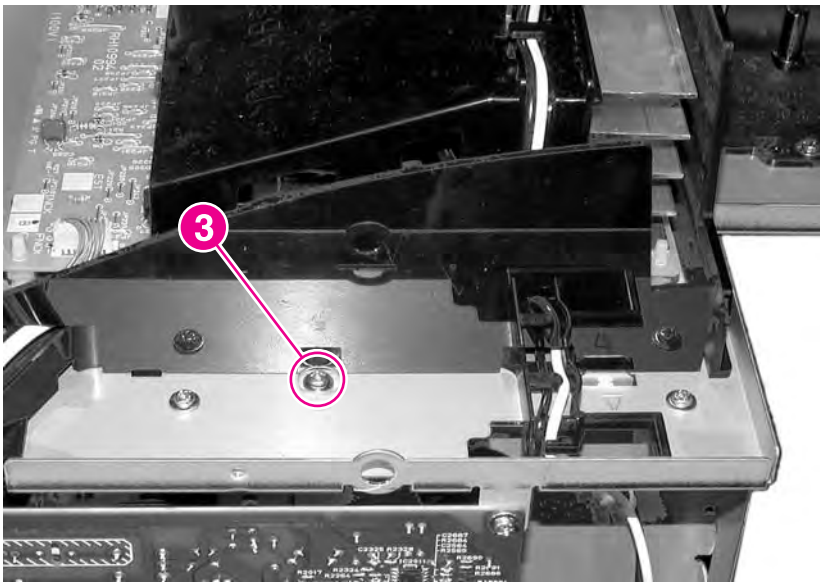


Figure 6-56 Remove the right side laser/scanner retaining bar (1 of 2, right side of printer)

7 On the right side of the printer, push the top of the sheet-metal scanner retaining bar in towards the laser/scanners (callout 4).

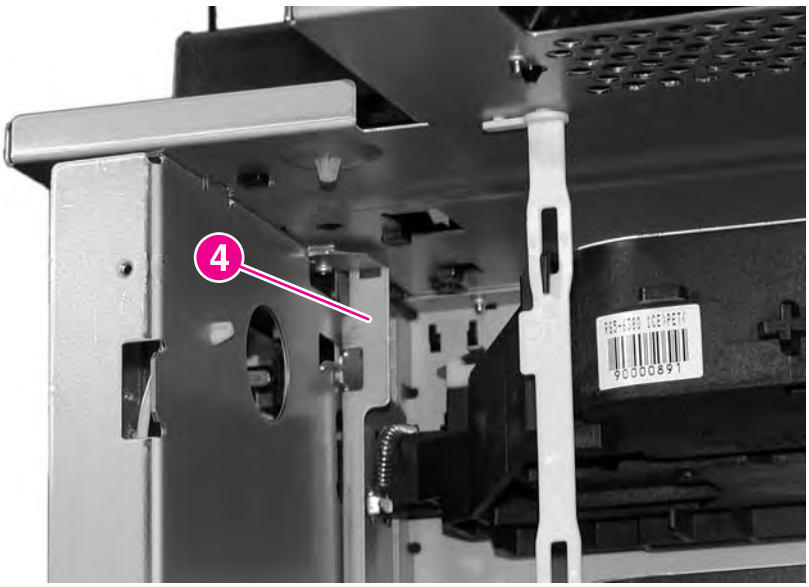


Figure 6-57 Remove the right side laser/scanner retaining bar (2 of 2, rear of printer)

8 Rotate the bar down and carefully remove it from the printer.

Reinstallation tip Reinstall the laser/scanner retaining bars in the same order that you removed them: the left side and then the right side. Feed the connector cables through the frame and reconnect the connectors to the DC controller.

To remove the laser/scanner assemblies

CAUTION The laser/scanner unit can be replaced, but the unit is not adjustable in the field. Do not disassemble it.

1. Remove the laser/scanner retaining bars. See Remove the laser/scanner retaining bars.
2. Slide the cyan laser/scanner unit to the left and then pull it out of the printer.
3. For the yellow, magenta, and black laser/scanner units, first unhook each assembly from the white strap (callout 1). Then pull the laser/scanner units out of the printer.

CAUTION When reinstalling the laser/scanner units, always reconnect them to the strap (callout 1). Failure to do so could cause the laser/scanners to become distorted, and the laser beam could become skewed, resulting in image defects.

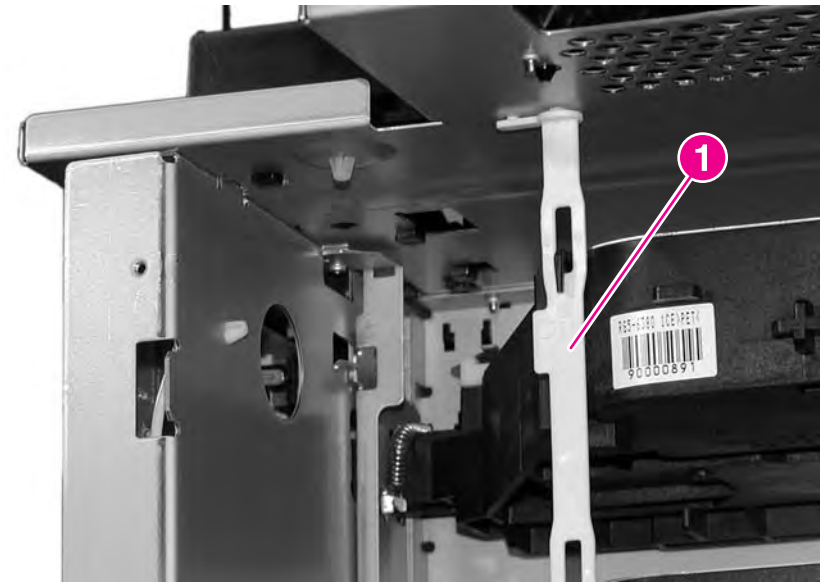


Figure 6-58 Remove the laser/scanner assemblies

Internal components (right side)

The following procedures explain the removal and replacement of internal components that are accessed from the right side of the printer.

High-voltage power supply PCA

WARNING! The high-voltage power supply PCA is an electrostatic-sensitive device.

1 Remove the following assemblies:

- Rear cover. See Rear cover.
- Top cover. See Top cover.
- Rear top cover. See Rear top cover.
- Right cover. See Right cover.

2 Remove three screws (callout 1).

3 Pinch the four retainer clips (callout 2) to release the board.

4 Disconnect the connector, and then Remove the high-voltage power supply PCA.

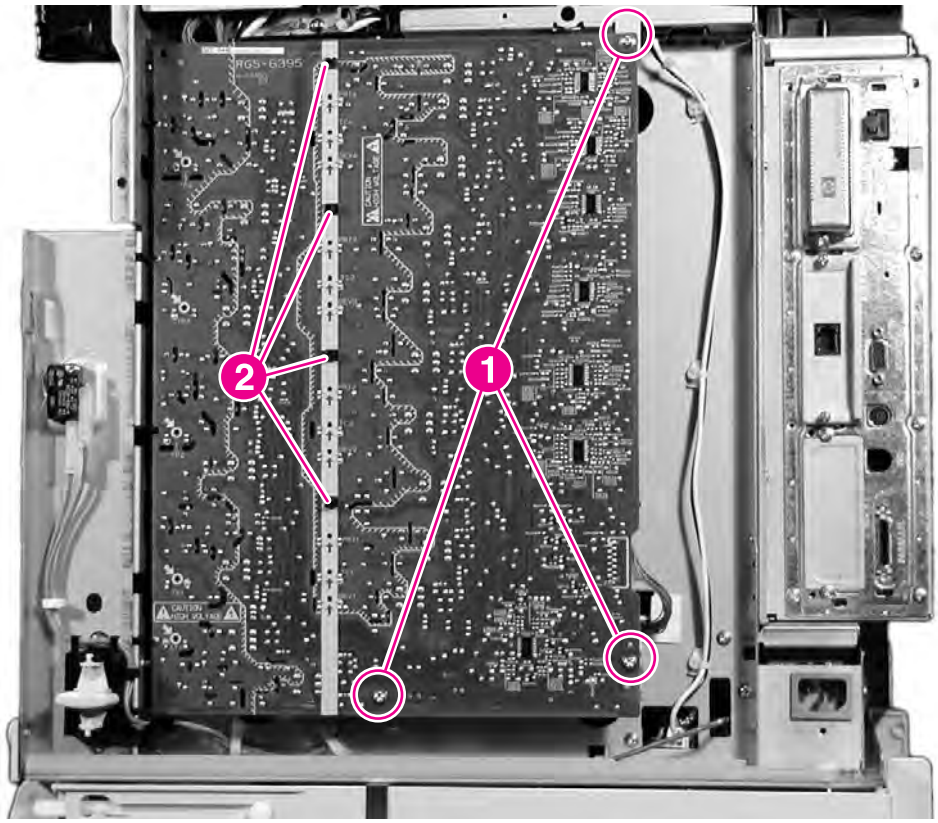


Figure 6-59 Remove the high-voltage power supply PCA

Reinstall the high-voltage power supply PCA

1. When reinstalling the high-voltage power supply PCA, be sure to align the white markings on the left side of the PCA with the hooks on the printer, and then snap in the PCA.
2. Verify that the PCA is aligned correctly by looking through the 12 holes on the PCA (callout 3).
3. When the PCA is aligned correctly, you can see part of the contact springs (callout 4) when you look through the holes.

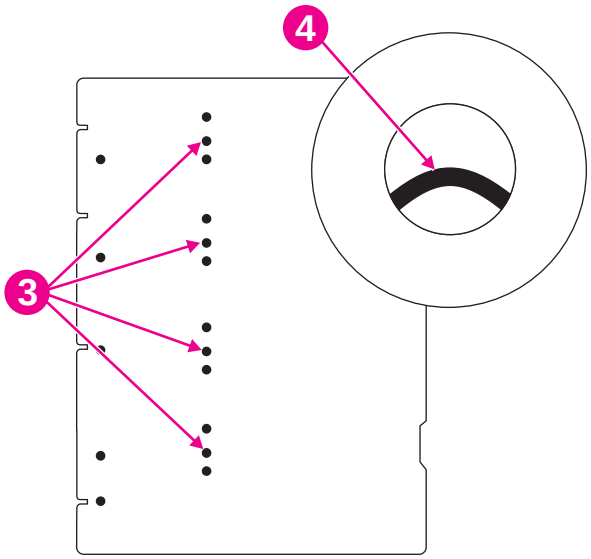


Figure 6-60 Reinstall the high-voltage power supply PCA

Toner level detection PCA

WARNING! The toner-level detection PCA is an electrostatic-sensitive device.

1 Remove the following assemblies:

- Rear cover. See Rear cover.
- Top cover. See Top cover.
- Rear top cover. See Rear top cover.
- Right cover. See Right cover.
- High-voltage power supply PCA. See High-voltage power supply PCA.

2 Remove three screws (callout 1).

3 Disconnect one connector (callout 2).

4 Remove the toner-level detection PCA (callout 3).

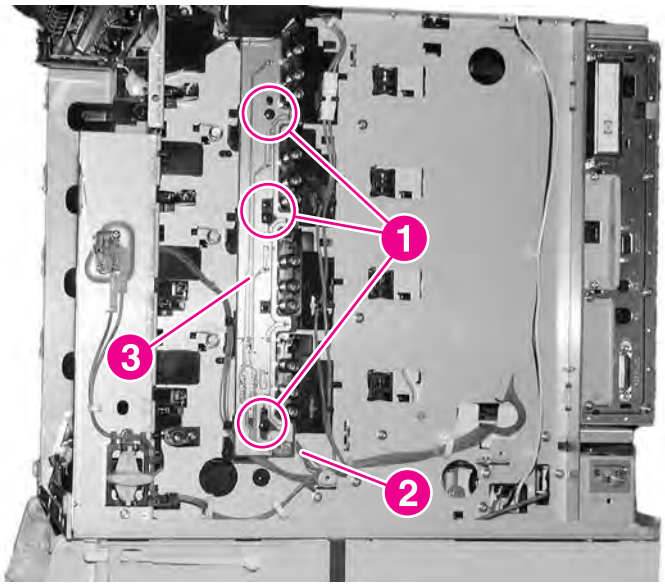


Figure 6-61 Remove the toner level detection PCA

High-voltage contact blocks

1. Remove the following assemblies:
   - Rear cover. See Rear cover.
   - Top cover. See Top cover.
   - Rear top cover. See Rear top cover.
   - Right cover. See Right cover.
   - High-voltage power supply PCA. See High-voltage power supply PCA.
   - Toner-level detection PCA. See Toner level detection PCA.
2. Remove one screw (callout 1).
3. Remove wires from the guides (callout 2).
4. Remove the high-voltage contact block (callout 3).
5. Repeat steps 2 through 4 for each of the four high-voltage contact blocks.

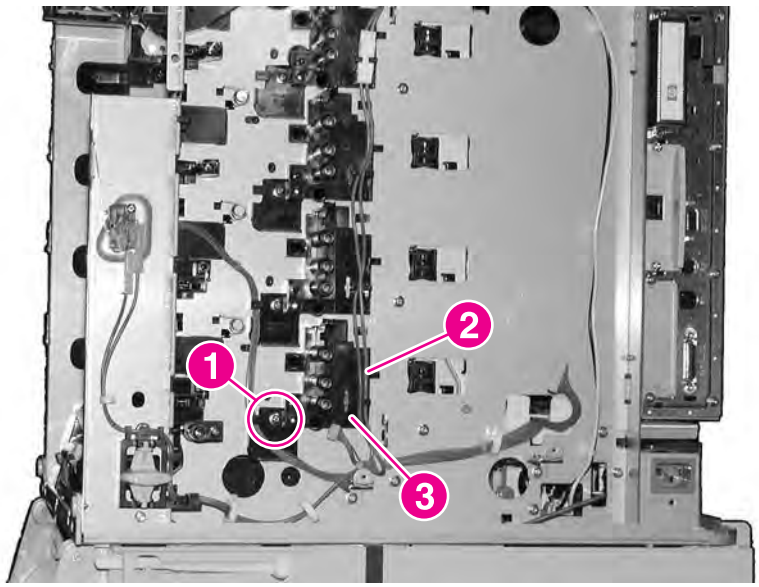


Figure 6-62 Remove the high-voltage contact blocks (cyan is shown)

Door switch

1 Remove the following assemblies:

- Rear cover. See Rear cover.
- Top cover. See Top cover.
- Rear top cover. See Rear top cover.
- Right cover. See Right cover.

2 Remove one screw (callout 1).

3 Disconnect two connectors (callout 2).

4 Remove the door switch.

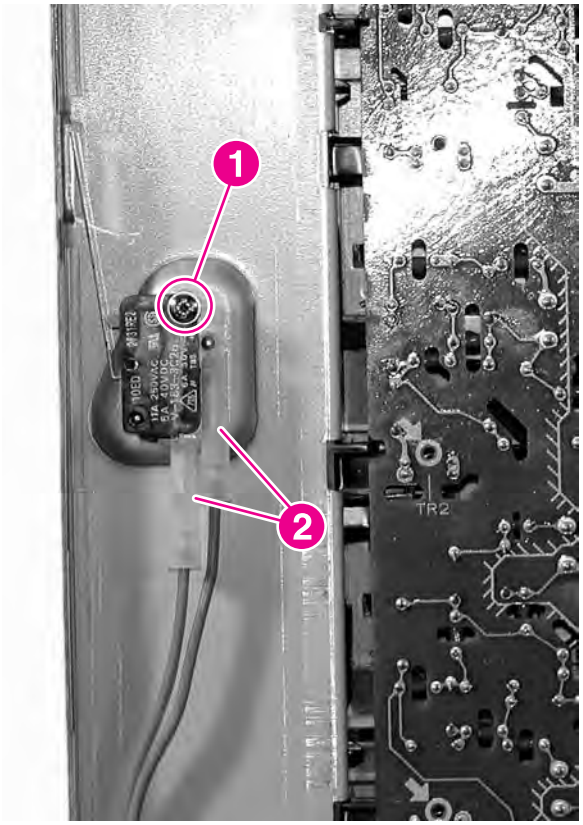


Figure 6-63 Remove the door switch

Internal components (top)

The following procedures explain the removal and replacement of internal components that are accessed from the top of the printer.

Fuser power supply PCA

WARNING! The fuser power supply PCA is an electrostatic sensitive device.

1 Remove the following assemblies:

- Rear cover. See Rear cover.
- Top cover. See Top cover.
- Rear top cover. See Rear top cover.

2 Disconnect the J203 connector (callout 1).

3 Remove the cable (callout 2) from the fuser power supply cover.

4 Remove one screw (callout 3), and then remove the fuser power supply cover (callout 4).

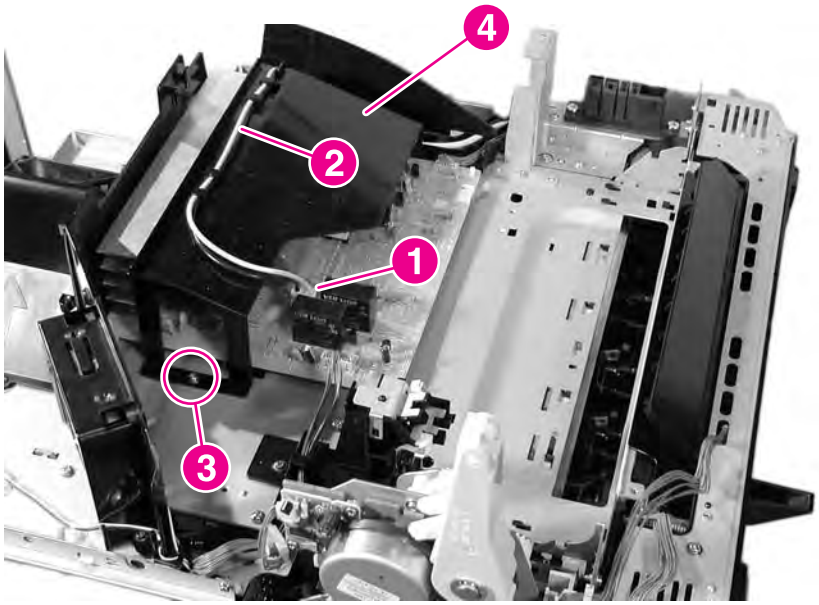


Figure 6-64 Remove the fuser power supply PCA (1 of 2)

5 Remove two screws (callout 5), and then use needle-nose pliers to remove four clips (callout 6).

6 Disconnect four connectors (callout 7), and then remove the fuser power supply PCA.

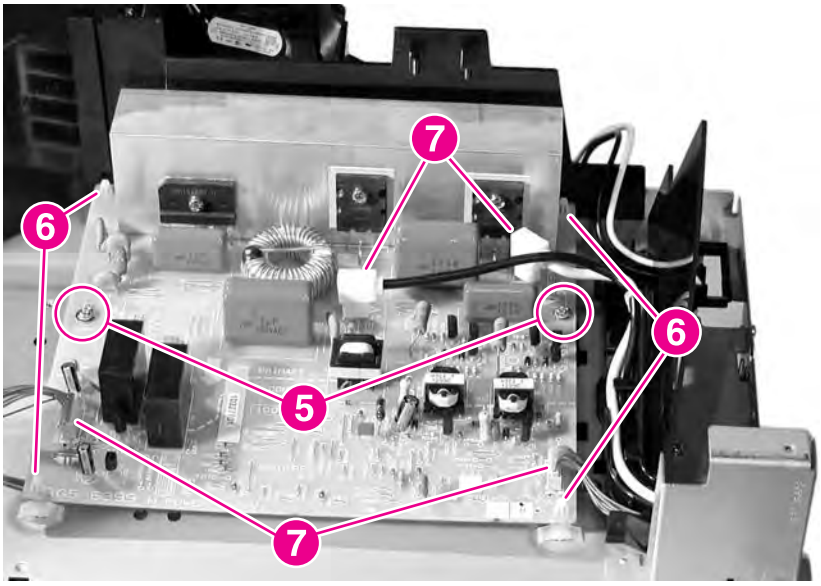


Figure 6-65 Remove the fuser power supply PCA (2 of 2)

Reinstallation tip When reinstalling the fuser power supply PCA, connect the J203 connector last.

Fuser drive unit

1 Remove the following assemblies:

- Rear cover. See Rear cover.
- Top cover. See Top cover.
- Rear top cover. See Rear top cover.
- Left cover. See Left cover.
- Control panel. See Control panel.

2 From the left side of the printer, at the top and front of the chassis, unhook the white tab that holds the hinge cover in place, and remove the hinge cover. (This tab is located above and to the right of the black-drum drive unit.)

3 On the DC controller, disconnect the three connectors J1002, J1030, and J1034.

4 Remove twoe screws (callout 1).

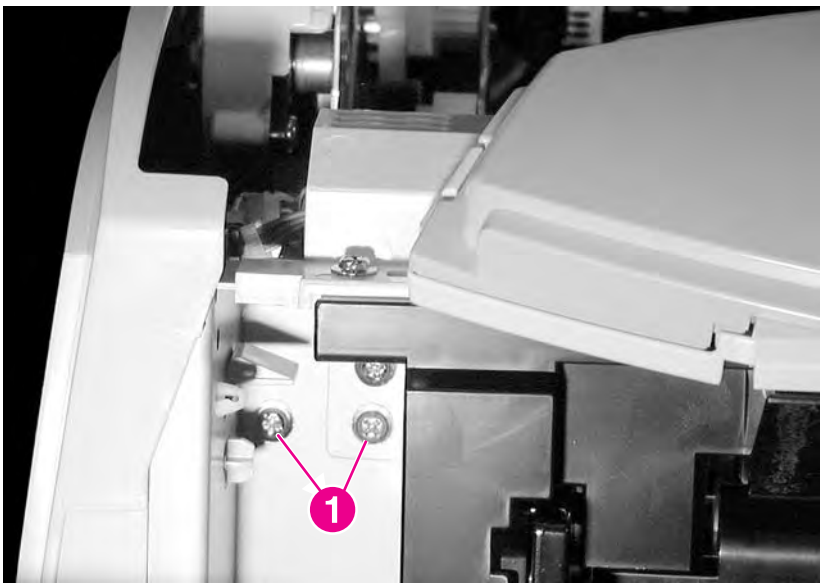


Figure 6-66 Remove the fuser drive unit (1 of 2)

5 Disconnect the connector (callout 2) and then remove one screw (callout 3). (This connector is hidden in Figure 6-67 Remove the fuser drive unit (2 of 2). It is on the rear left side of the fuser drive unit).

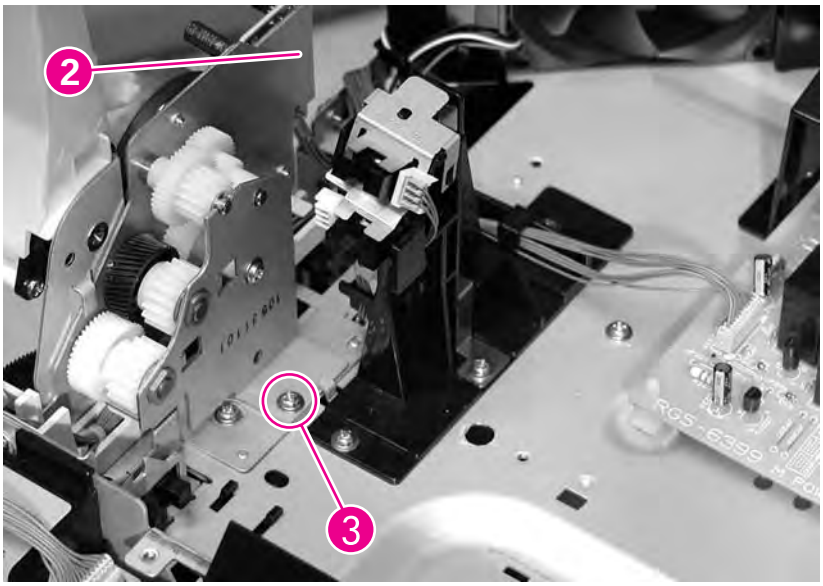


Figure 6-67 Remove the fuser drive unit (2 of 2)

6 Remove the fuser drive unit from the printer.

7 Remove the screw that attaches the hinge unit, and remove the hinge unit from the fuser drive.

Fuser inlet paper sensor

1 Remove the following assemblies:

- Rear cover. See Rear cover.
- Top cover. See Top cover.
- Rear top cover. See Rear top cover.
- Fuser. See Replacing the fuser.

2 Unhook two tabs (callout 1; they are on the front of the sensor).

3 Disconnect the connector directly in front of those tabs (this connector is hidden in the photo).

4 Remove the fuser paper sensor (callout 2).

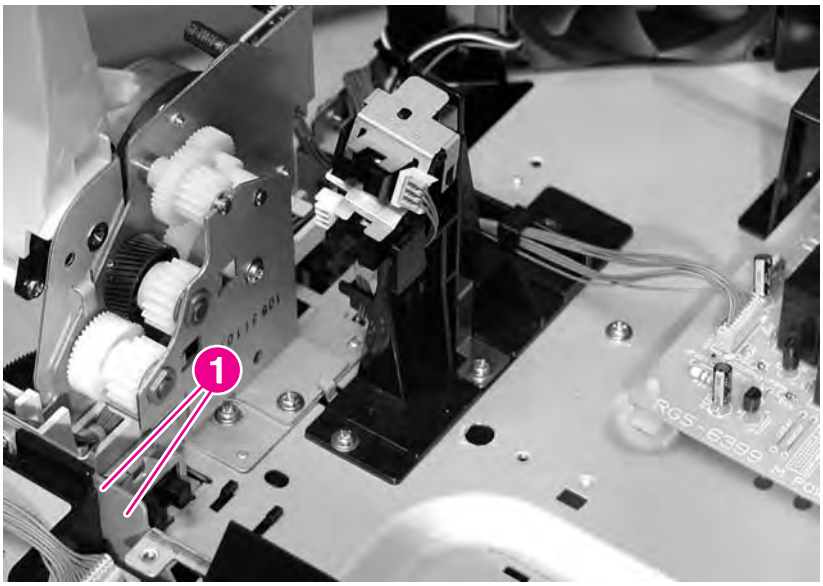


Figure 6-68 Remove the fuser paper sensor

Fuser delivery sensor

1 Remove the following assemblies:

- Rear cover. See Rear cover.
- Top cover. See Top cover.
- Rear top cover. See Rear top cover.
- Fuser. See Replacing the fuser.

2 Unhook the two tabs on the back of the sensor (on the connector side).

3 Disconnect one connector (callout 1).

4 Remove the fuser delivery sensor (callout 2).

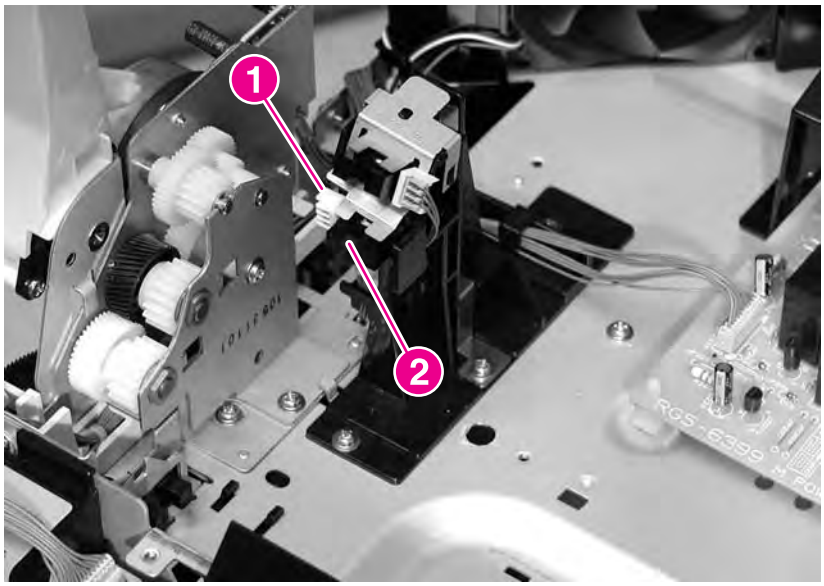


Figure 6-69 Remove the fuser delivery sensor

Output-bin-full sensor

1. Remove the following assemblies:
   - Rear cover. See Rear cover.
   - Top cover. See Top cover.
   - Rear top cover. See Rear top cover.
   - Fuser. See Replacing the fuser.
2. Unhook the two tabs (callout 1).
3. Disconnect one connector (callout 2).
4. Remove the output-bin-full sensor (callout 3).

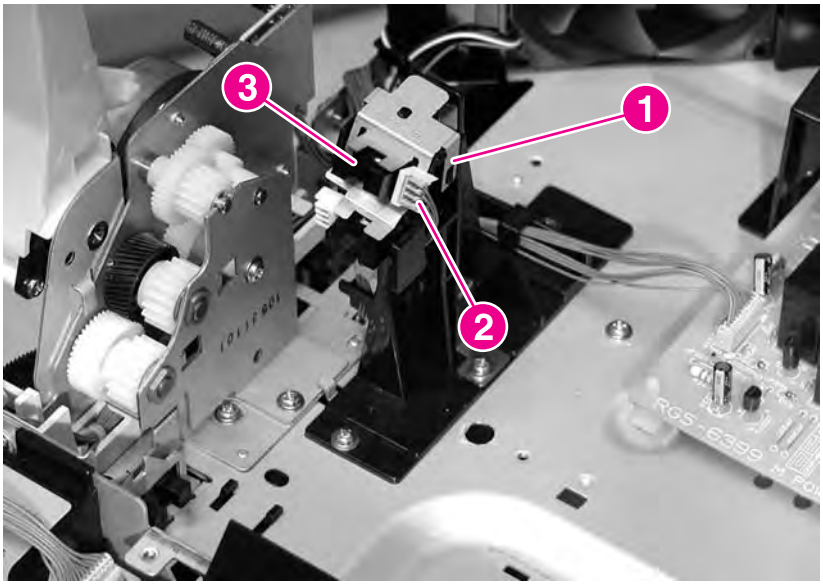


Figure 6-70 Remove the output-bin-full sensor

Cartridge fan

NOTE The cartridge fan is the vertical fan that is closest to the front of the printer.

1. Remove the following assemblies:
   - Rear cover. See Rear cover.
   - Top cover. See Top cover.
   - Rear top cover. See Rear top cover.
   - Left cover. See Left cover.
   - DC controller shield. See DC controller shield.
2. Disconnect the connector J1004 on the DC controller PCA.
3. Remove the cables from the guides (callout 1).
4. Remove the two screws (callout 2).
5. Remove the fan holder and fan from the printer (callout 3).
6. Remove the fan from the fan holder.

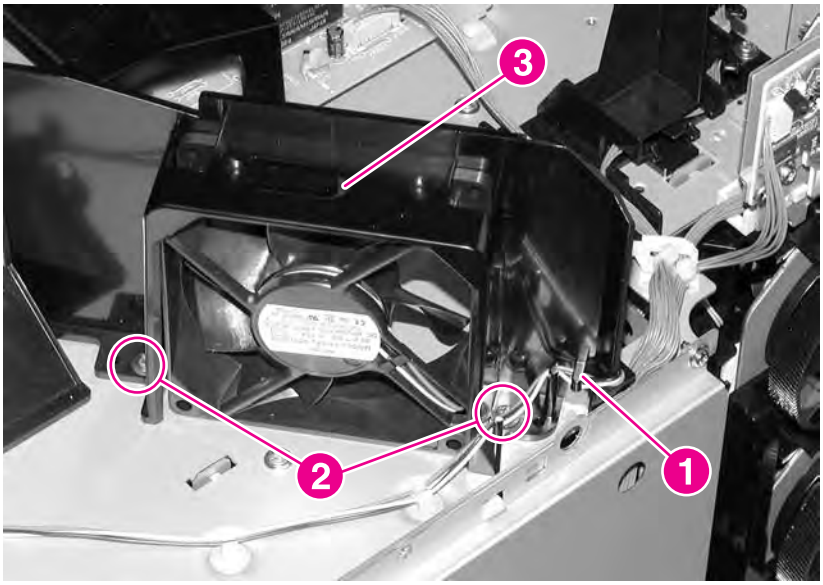


Figure 6-71 Remove the cartridge fan

Formatter fan

NOTE The formatter fan is the horizontal fan that is closest to the rear of the printer.

1. Remove the following assemblies:
   - Rear cover. See Rear cover.
   - Top cover. See Top cover.
   - Rear top cover. See Rear top cover.
   - Left cover. See Left cover.
   - DC controller shield. See DC controller shield.
   - Cartridge fan and holder. See Cartridge fan.
2. Disconnect the connector J1003 on the DC controller.
3. Remove two screws (callout 1).
4. Remove the fan holder and fan from the fan printer.
5. Remove the fan from the fan holder.

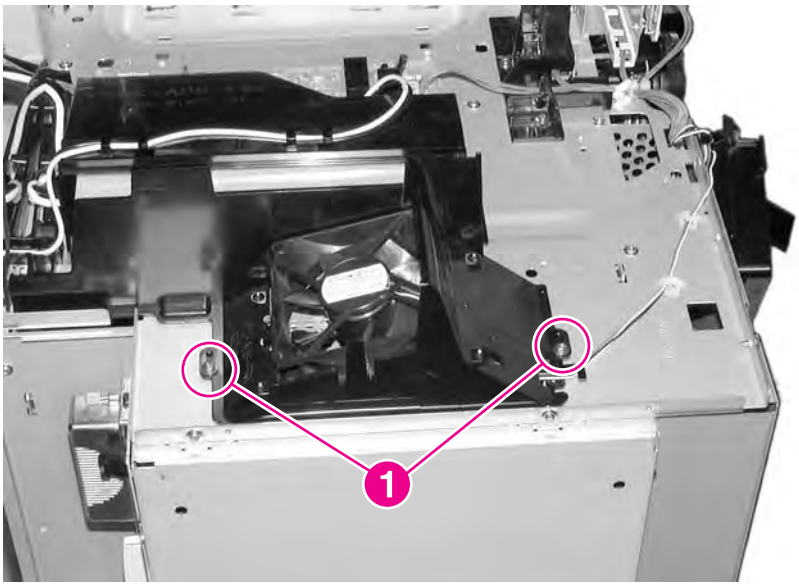


Figure 6-72 Remove the formatter fan

Reinstallation tip When reinstalling the formatter fan, make sure that the arrow on the fan holder and the arrow on the fan are pointing in the same direction.

Optional 500-sheet paper feeder (HP Color LaserJet 4600 and 4650 models only)

Use the following procedures to remove and replace components on the 500-sheet paper feeder.

500-sheet paper feeder top cover plate

1 Remove two screws (callout 1), and then remove the front cover from the 500-sheet paper feeder.

2 Remove the six screws (callout 2), and then remove the top plate.

NOTE The internal components of the 500-sheet paper feeder are mounted on the underside of the top cover plate.

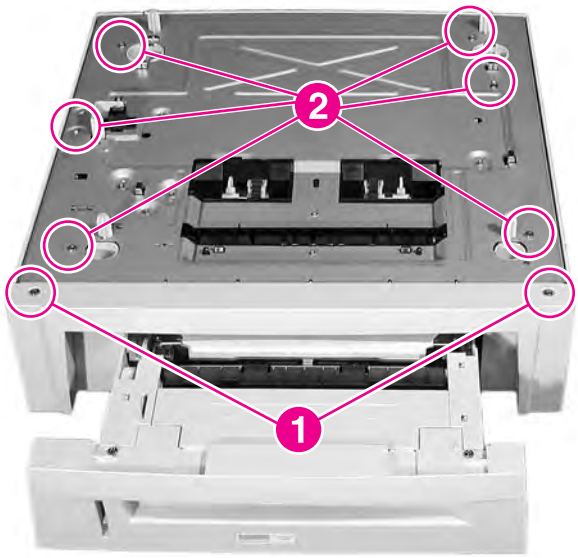


Figure 6-73 Remove the 500-sheet paper feeder top cover plate

500-sheet paper feeder drive unit

1. Remove the top cover plate from the 500-sheet paper feeder (see 500-sheet paper feeder top cover plate), and turn it upside-down.
2. Remove the spring and the E-ring (callout 1).
3. Unhook the tab in the center of the gear (callout 2), and remove the gear.
4. Disconnect three connectors (callout 3; two of the connectors are on the paper feeder PCA).
5. Remove two screws (callout 4), and then slide the drive unit out.

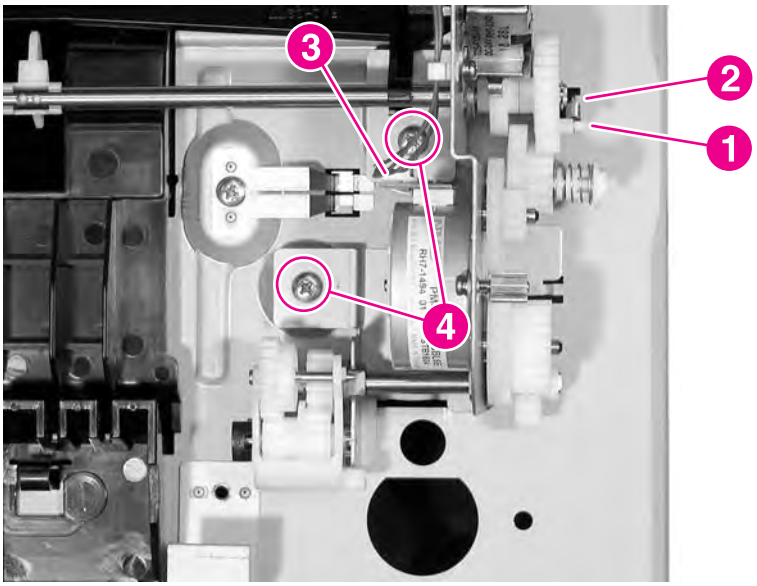


Figure 6-74 Remove the 500-sheet paper feeder drive unit (1 of 2, top view)

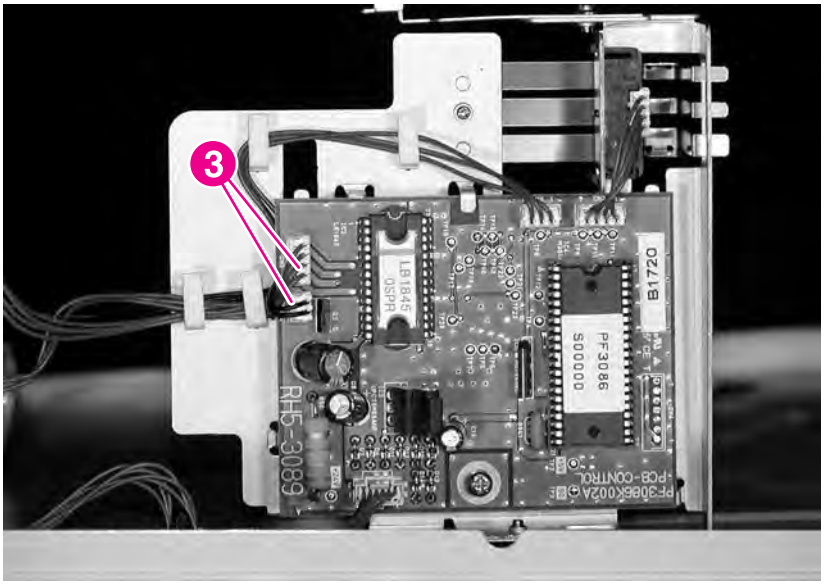


Figure 6-75 Remove the 500-sheet paper feeder drive unit (2 of 2, side view)

Reinstall the 500-sheet paper-feeder drive unit

1 When reassembling the drive unit, position the cam (callout 5) on the shaft. See Figure 6-76 Reinstall the 500-sheet paper-feeder drive unit.

2 Position the gear (callout 6) on the shaft.

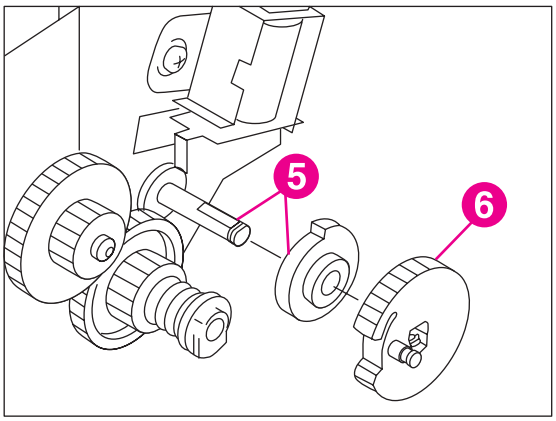


Figure 6-76 Reinstall the 500-sheet paper-feeder drive unit

500-sheet paper-feeder pickup rollers

The procedure for removing the 500-sheet paper feeder pickup rollers is essentially the same as for the cassette (tray 2) pickup rollers. See Cassette (tray 2) paper pickup rollers.

500-sheet paper-feeder PCA

WARNING! The paper-feeder PCA is an electrostatic sensitive device.

1. Remove the top plate from the 500-sheet paper feeder (see 500-sheet paper feeder top cover plate), and then turn it upside-down.
2. Disconnect five connectors (callout 1).
3. Remove the screw (callout 2).
4. Remove the paper-feeder PCA.

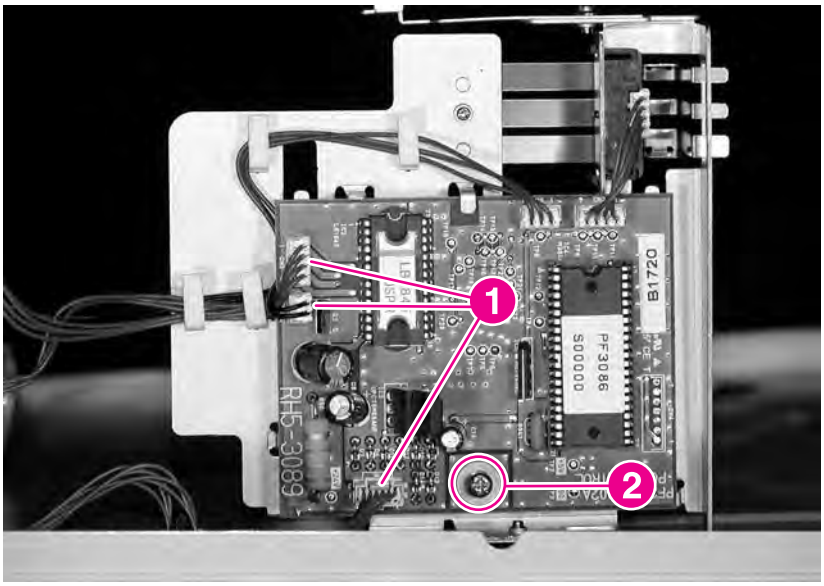


Figure 6-77 Remove the 500-sheet paper-feeder PCA

Optional 2 x 500-sheet paper feeder (tray 3/tray 4) (HP Color LaserJet 4650 only)

Use the following procedures to remove and replace components on the 2 x 500-sheet paper feeder.

2 x 500-sheet paper feeder front cover

1 Remove the tray 3/tray 4 cassettes.

2 On tray 3/tray 4 (the 2 X 500–sheet feeder), remove two screws (callout 1) and remove the front cover.

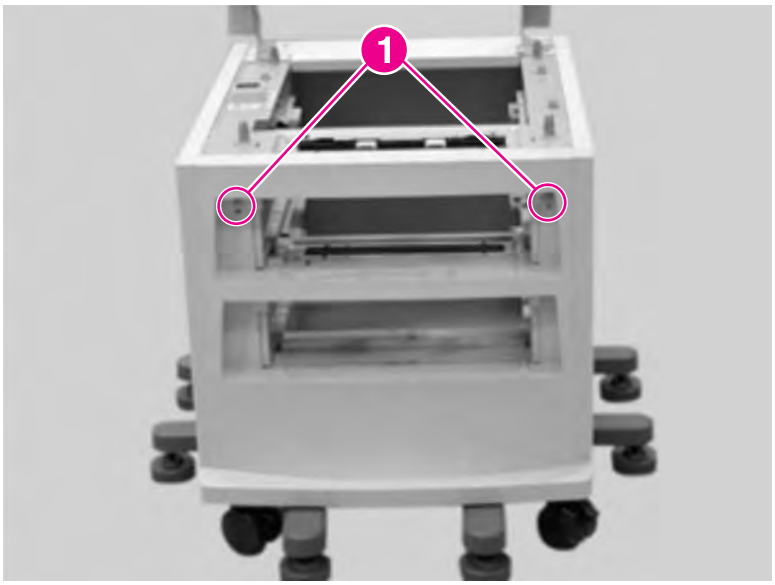


Figure 6-78 Remove the 2 x 500-sheet paper feeder front cover

2 x 500-sheet paper feeder rear cover

1 Remove two screws (callout 1) and remove the printer anchor plates (callout 2).

2 Remove six screws (callout 3) and remove the rear cover.

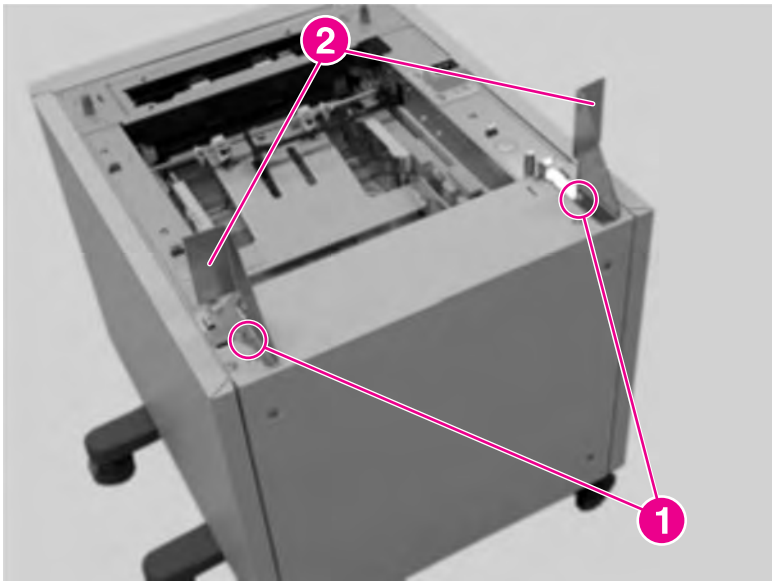


Figure 6-79 Remove the 2 x 500-sheet paper feeder rear cover (1 of 2)

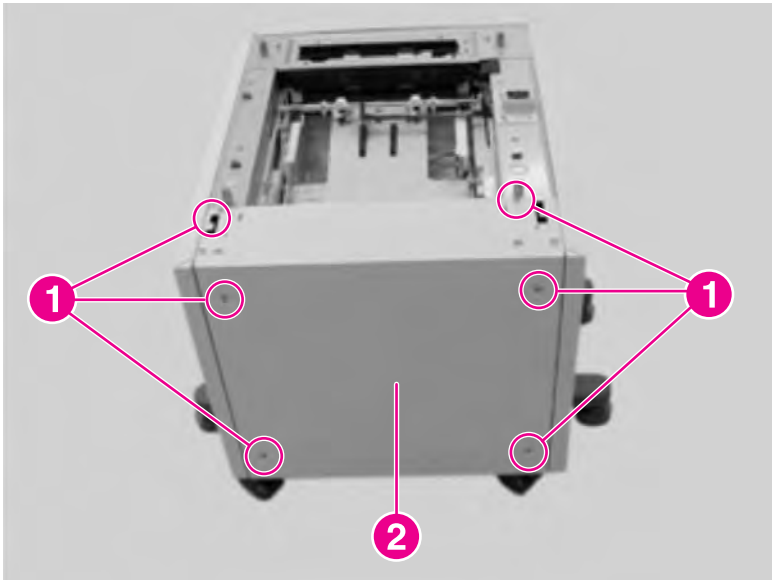


Figure 6-80 Remove the 2 x 500-sheet paper feeder rear cover (2 of 2)

2 x 500-sheet paper feeder left cover

1 Remove the following assemblies:

- 2 x 500-sheet paper feeder front cover. See 2 x 500-sheet paper feeder front cover.
- 2 x 500-sheet paper feeder rear cover. See 2 x 500-sheet paper feeder rear cover.

2 Remove four screws (callout 1) and remove the left cover.

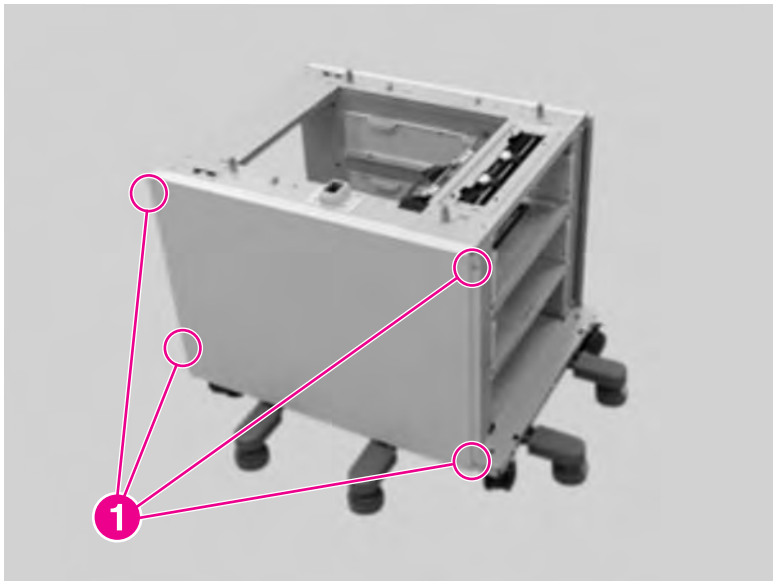


Figure 6-81 Remove the 2 x 500-sheet paper feeder left cover

2 x 500-sheet paper feeder right cover

1 Remover the following assemblies:

- 2 x 500-sheet paper feeder front cover. See 2 x 500-sheet paper feeder front cover.
- 2 x 500-sheet paper feeder rear cover. See 2 x 500-sheet paper feeder rear cover.

2 Remove four screws (callout 1) and then remove the right cover.

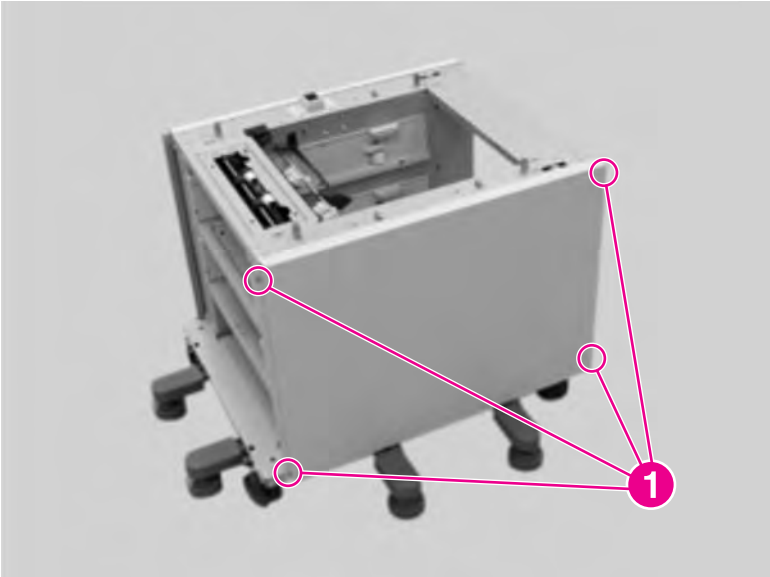


Figure 6-82 Remove the 2 x 500-sheet paper feeder right cover

2 x 500-sheet paper feeder upper-cassette pickup assembly

1 Remove the following assemblies:

- 2 x 500-sheet paper feeder left cover. See 2 x 500-sheet paper feeder left cover.
- 2 x 500-sheet paper feeder right cover. See 2 x 500-sheet paper feeder right cover.

2 Disconnect one connector (callout 1) and release the wire harness from the harness guides (callout 2).

3 Remove ten screws (callout 3) and remove the upper-cassette pickup assembly (callout 4).

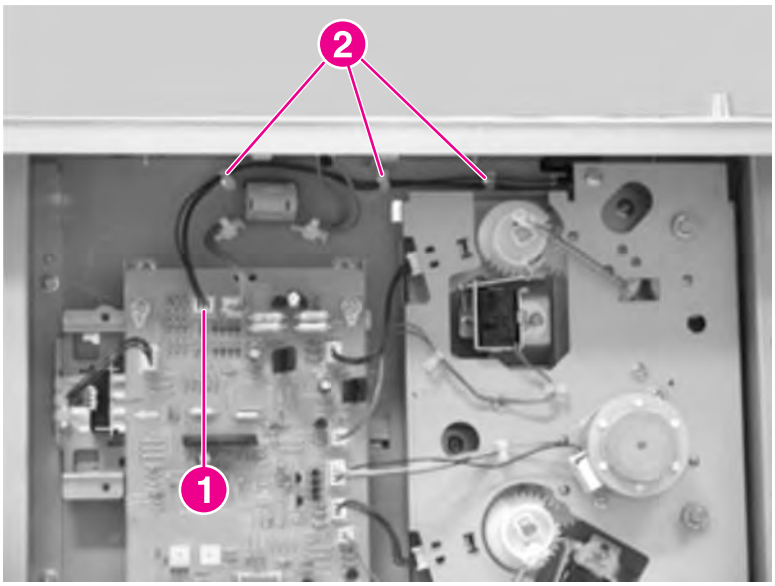


Figure 6-83 Remove the 2 x 500-sheet paper feeder upper-cassette pickup assembly (1 of 2)

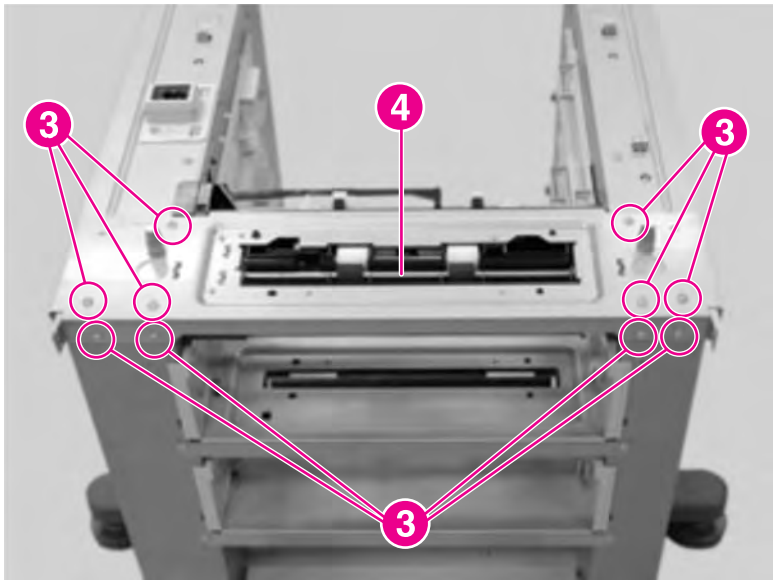


Figure 6-84 Remove the 2 x 500-sheet paper feeder upper-cassette pickup assembly (2 of 2)

2 x 500-sheet paper-feeder drive assembly

1. Remove the 2 x 500-sheet paper feeder left cover. See 2 x 500-sheet paper feeder left cover.
2. Disconnect two springs (callout 1).
3. Remove two gears (callout 2) by releasing the locking tabs and sliding the gears off of the shaft.
4. Disconnect five connectors (callout 3) and then remove three screws (callout 4).
5. Remove the 2 x 500-sheet paper-feeder drive assembly (callout 5).

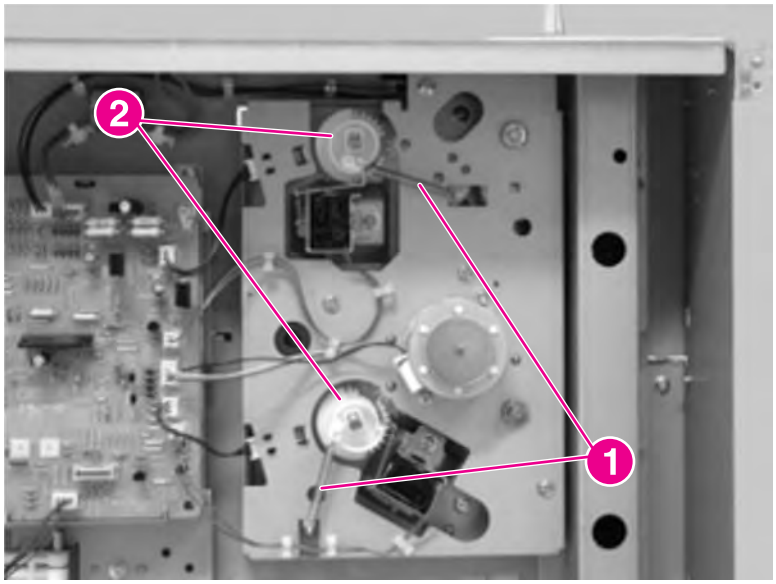


Figure 6-85 Remove the 2 x 500-sheet paper-feeder drive assembly (1 of 2)

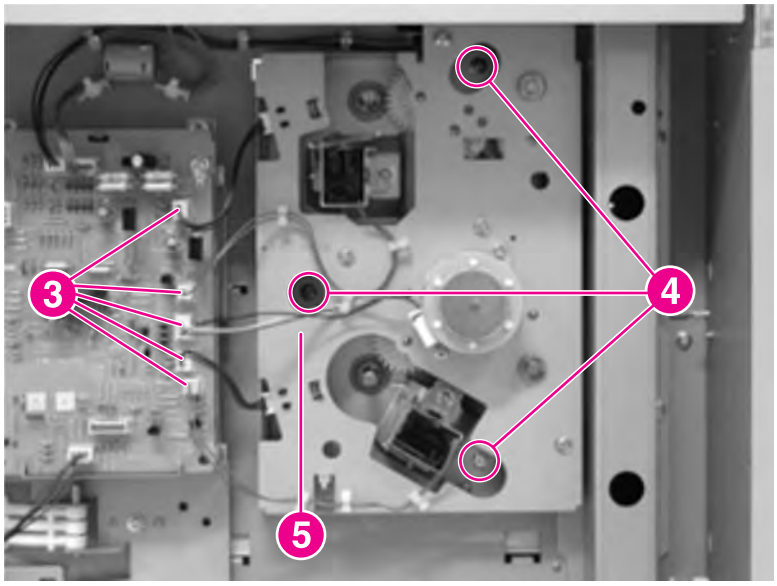


Figure 6-86 Remove the 2 x 500-sheet paper-feeder drive assembly (2 of 2)

2 x 500-sheet paper-feeder feed sensor

1. Remove the 2 x 500-sheet paper feeder upper cassette pickup assembly. See 2 x 500-sheet paper feeder upper-cassette pickup assembly.
2. Remove two screws (callout 1).
3. Release the two feed roller retaining tabs (callout 2) and then remove the feed roller assembly (callout 3).
4. Disconnect one connector (callout 4) and then remove the feed sensor (callout 5).

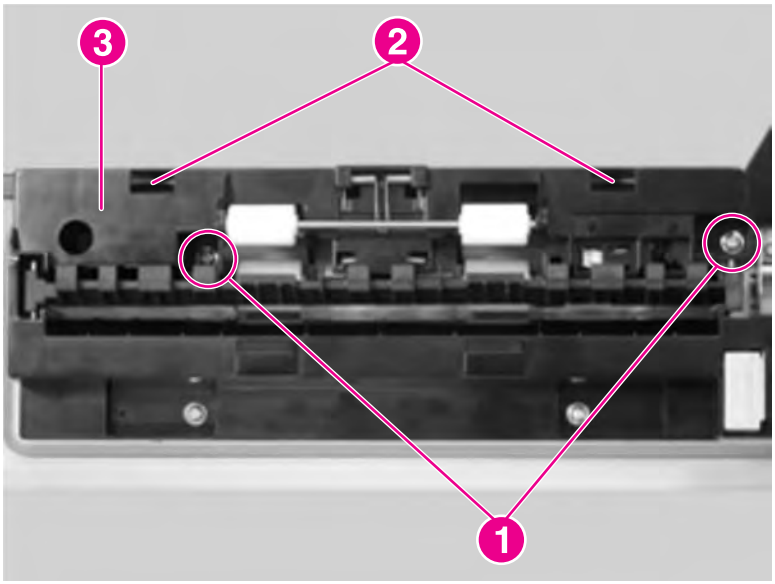


Figure 6-87 Remove the 2 x 500-sheet paper-feeder feed sensor (1 of 2)

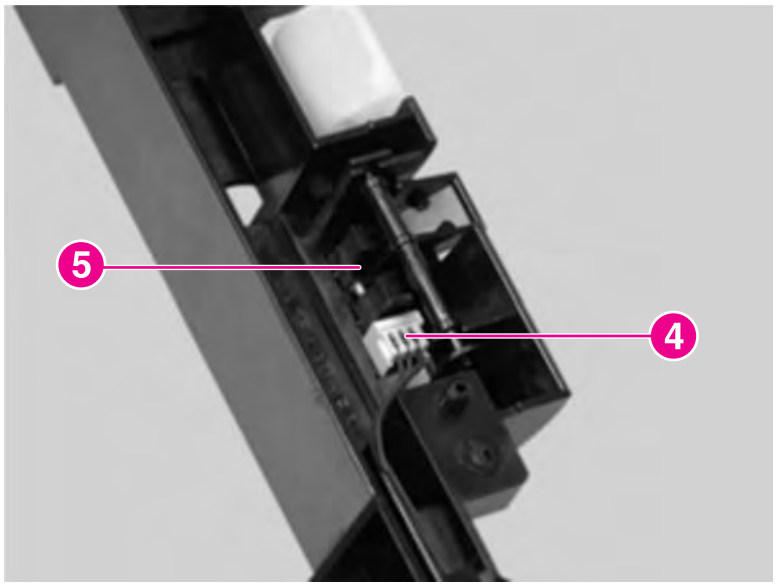


Figure 6-88 Remove the 2 x 500-sheet paper-feeder feed sensor (2 of 2)

2 x 500-sheet paper feeder upper- or lower-cassette paper sensor

1 Remove the 2 x 500-sheet paper feeder left cover. See 2 x 500-sheet paper feeder left cover.

2 Disconnect two springs (callout 1) and then remove two E-rings (callout 2).

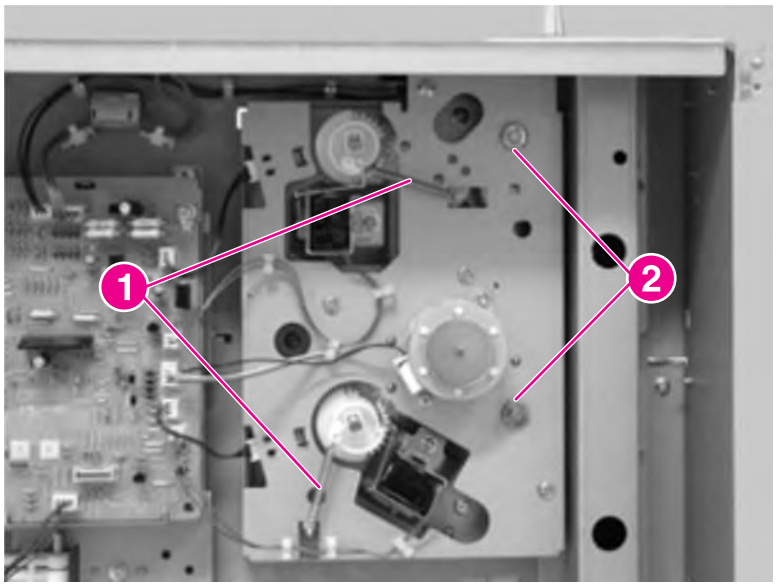


Figure 6-89 Remove 2 x 500-sheet paper feeder upper-cassette paper sensor (1 of 3)

3 Disconnect five connectors (callout 3) and then remove four screws (callout 4).

4 Remove the sheet-metal cover (callout 5).

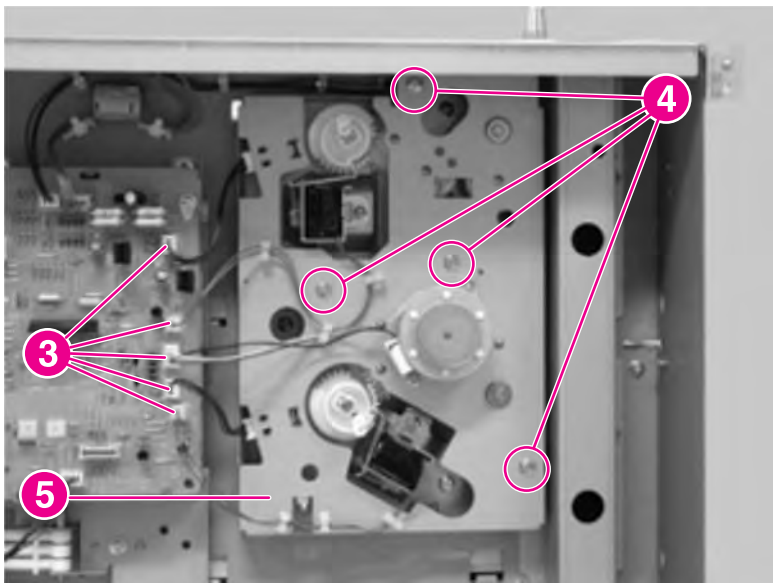


Figure 6-90 Remove 2 x 500-sheet paper feeder upper-cassette paper sensor (2 of 3)

5 For the upper-cassette paper sensor, disconnect one connector (callout 6) and then remove the upper-cassette paper sensor (callout 7).

6 For the lower-cassette paper sensor, disconnect one connector (callout 8) and then remove the lower-cassette paper sensor (callout 9).

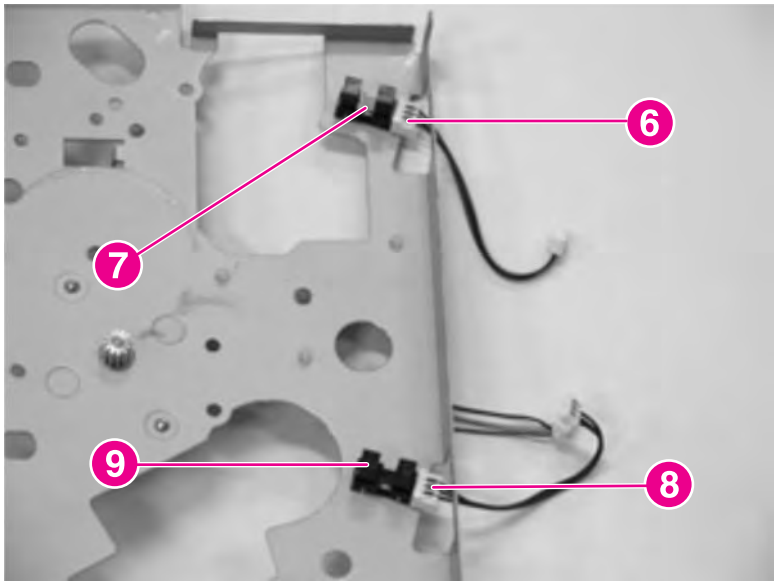


Figure 6-91 Remove 2 x 500-sheet paper feeder upper-cassette paper sensor (3 of 3)

2 x 500-sheet paper feeder upper- or lower-cassette paper-detection switch

1. Remove the 2 x 500-sheet paper feeder left cover. See 2 x 500-sheet paper feeder left cover.
2. For the upper cassette paper-detection switch, disconnect one connector (callout 1), release the switch retaining tabs (callout 2) and then remove the upper-cassette paper switch (callout 3).
3. For the lower cassette switch, disconnect one connector (callout 4), release the switch retaining tabs (callout 5) and then remove the lower-cassette paper sensor (callout 6).

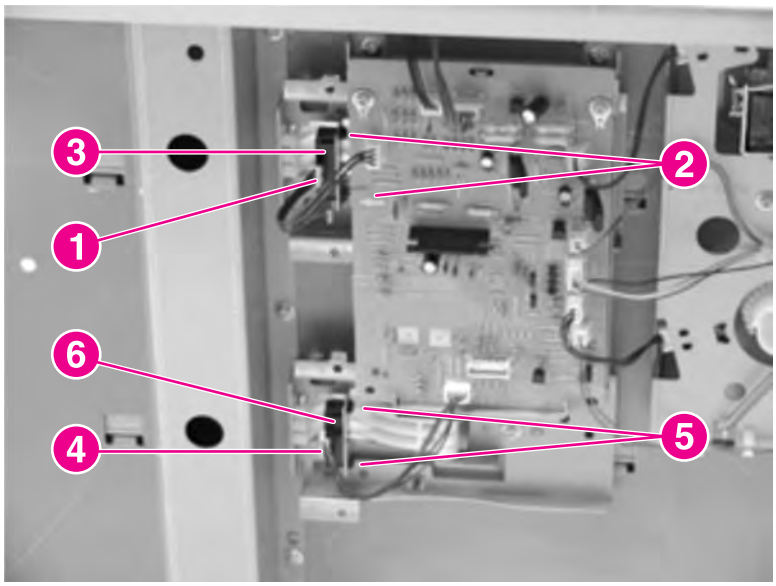


Figure 6-92 Remove 2 x 500-sheet paper feeder upper-cassette paper-detection switch

2 x 500-sheet paper-feeder driver PCA

1. Remove the 2 x 500-sheet paper feeder left cover. See 2 x 500-sheet paper feeder left cover.
2. Disconnect nine connectors (callout 1) and then remove two screws (callout 2).
3. Remove the 2 x 500-sheet paper-feeder driver PCA (callout 3)

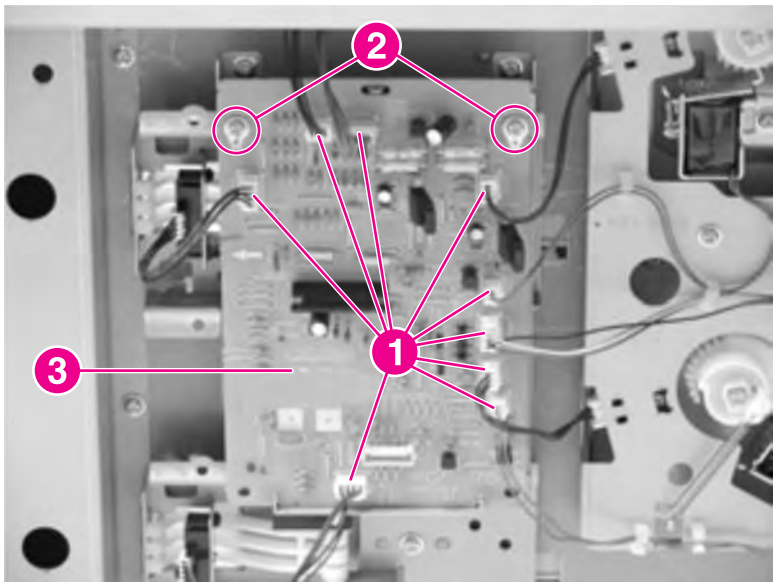


Figure 6-93 Remove the 2 x 500-sheet paper-feeder driver PCA

2 x 500-sheet paper feeder pickup rollers

1 Locate the upper and lower pickup rollers (callout 1).

2 For the upper pickup rollers: Separate the feeder from the printer. Push firmly on the roller to remove it from the roller shaft. Repeat this step for the remaining roller.

3 For the lower pickup roller: Remove the upper cassette from the feeder. Push firmly on the roller to remove it from the roller shaft. Repeat this step for the remaining roller.

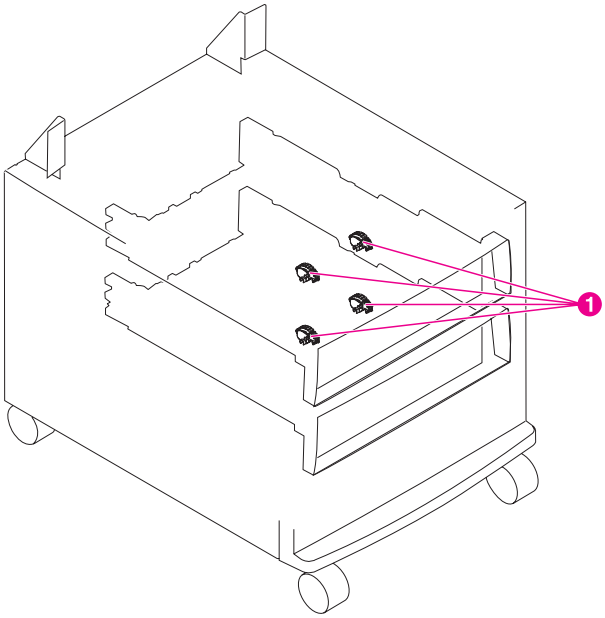


Figure 6-94 Remove the 2 x 500-sheet paper feeder pickup rollers

Reinstallation tip When reinstalling the paper pickup rollers, be sure to fit the pins on the pickup roller into the holes on the pickup roller shaft.

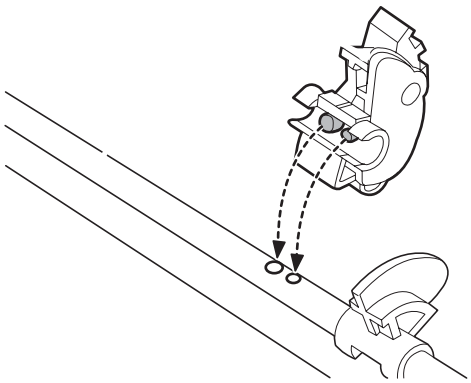


Figure 6-95 Reinstall the 2 x 500-sheet paper feeder pickup rollers

7 Troubleshooting

This chapter contains information about the following topics:

- Introduction
- Troubleshooting process
- Printer-error troubleshooting
- Replacement-parts configuration (HP Color LaserJet 4610n and 4650 models)
- Paper-path troubleshooting
- Media-transport troubleshooting
- Image-formation troubleshooting
- Image defects troubleshooting
- Interface troubleshooting
- Control-panel troubleshooting
- Tools for troubleshooting
- Diagnostics
- Test pages
- Engine resets
- Service menu
- Diagrams

Introduction

The information in this troubleshooting chapter is presented with the assumption that the reader has a basic understanding of the color laser-printing process. Explanations of each mechanical assembly, printer systems, and the basic theory of operation are provided in chapter 5. Do not perform any of these troubleshooting processes without fully understanding the function of each mechanism.

This chapter contains the following sections:

- **Troubleshooting process** includes a pre-troubleshooting checklist and a troubleshooting flowchart. These tools contain information about common printer errors that can inhibit proper operation or create print-quality problems. These tools also include recommendations for solving the cause of the error.
- **Printer-error troubleshooting** explains each control-panel-display message and suggests recommendations for clearing the cause of each message. When the printer message indicates a failure for which the root cause is not obvious, use the printer-error troubleshooting section and the troubleshooting tools section in this chapter to solve the problem.
- **Replacement parts configuration** describes the procedures that are involved when replacing parts on the HP Color LaserJet 4610n and 4650 models.
- **Paper-path troubleshooting** provides techniques to solve feed problems. Explanations are provided about print-media checks, jam troubleshooting, and the differences between jams caused by media and those caused by the printer.
- **Media-transport troubleshooting** provides information about identifying and resolving print-media feed problems.
- **Image-formation troubleshooting** suggests methods for solving print-quality problems.
- **Image-defects troubleshooting** lists image defects that can occur, and describes possible causes of the defects and procedures to resolve the problem.
- **Interface troubleshooting** provides techniques for isolating communication problems to the printer hardware, printer configuration, network configuration, or software program.
- **Control panel troubleshooting** provides procedures for printing a menu map from the printer control panel. It also describes the control-panel menus, the items within each menu, and the possible values for the menu items.
- **Tools for troubleshooting** help isolate the cause of printer failures. This section includes explanations of the printer configuration page and the event log.
- **Diagnostics** provides instructions about how to gain access to and use the diagnostic tools that are incorporated into the printer.
- **Test pages** explains tests that can be used to determine whether the print engine and formatter are functioning.
- **Engine reset** describes how to perform an engine reset.
- **Service menu** provides procedures for opening the service menu and performing service-oriented tasks. These tasks include counts for entering the serial number, service ID, transfer unit maintenance, fuser maintenance, color page, and total page, and clearing the event log.

- **Diagrams** provides graphical locations and tables for the printer's internal assemblies and sensors.

Troubleshooting process

When the printer malfunctions or encounters an unexpected situation, the printer control panel alerts you to the situation. This section contains a pre-troubleshooting checklist to filter out many possible causes of the problem. A troubleshooting flowchart helps you diagnose the root cause of the problem. The remainder of this chapter provides steps for correcting problems.

- Use the pre-troubleshooting checklist to evaluate the source of the problem and to reduce the number of steps that are required to fix the problem.
- Use the troubleshooting flowchart to pinpoint the root cause of hardware malfunctions. The flowchart guides you to the appropriate section of this chapter that provides steps for correcting the malfunction.

Before beginning any troubleshooting procedure, check the following conditions:

- Are supply items within their rated life?
- Does the configuration page reveal any configuration errors?

NOTE The customer is responsible for checking supplies and for using supplies that are in good condition.

Pre-troubleshooting checklist

The list below describes basic questions to ask the customer to help quickly define the problem(s).

Table 7-1 Pre-troubleshooting checklist

Environment	■ Is the printer installed on a solid, level surface? ■ Is the printer to particle matter or dust? ■ Is the power-supply voltage within ± 10 volts of the specified power source? ■ Is the power supply plug inserted in the printer and the outlet? ■ Is the operating environment within the specified parameters, as listed in chapter 1 of this manual? ■ Is the printer exposed to ammonia gas, such as that produced by diazo copiers or office cleaning materials? ■ Is the printer exposed to direct sunlight?
Media	■ Does the customer use only supported media? ■ Is the media in good condition (contains no curls, folds, and so forth)? ■ Is the media stored correctly and within environmental limits?
Input trays	■ Is the amount of media in the tray within specifications? ■ Is the media placed in the tray correctly? ■ Are the paper guides aligned with the media? ■ Is the cassette correctly installed in the printer?
Print cartridges	■ Is each print cartridge correctly installed?
ETB and fuser	■ Are the ETB and fuser correctly installed?
Covers	■ Are the top cover and front cover closed?
Condensation	■ Does condensation occur following a temperature change (particularly in winter following cold storage)? If so, wipe the affected dry or leave the printer on for 10 to 20 minutes. ■ Was a print cartridge installed soon after being moved from a cold to a warm room? If so, allow the printer to sit at room temperature for one to two hours.
Miscellaneous	■ Check for and remove any non-HP components (print cartridges, memory modules, and EIO cards) from the printer. ■ If hardware or software configuration has not changed, or the problem is not associated with any specific software, contact the Customer Care Center (see chapter 1).

Table 7-1 Pre-troubleshooting checklist (continued)

	■ Remove the printer from the network, and ensure that the failure is associated with the printer before beginning troubleshooting. ■ For any print quality issues, calibrate the printer. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).

Troubleshooting basics

The procedure that follows highlights the general processes that you can use to isolate and solve printer hardware problems quickly.

Each step depicts a major troubleshooting step. A "yes" answer to the questions allows you to proceed to the next major step.

A "no" answer indicates that additional testing is needed. Proceed to the referenced section in this chapter, and follow the instructions there. After completing this additional testing, proceed to the next major step in the troubleshooting flowchart.

1 Turn the power on. Does a readable message appear on the control-panel display? If yes, then go to step 2. If no, then check the following items.

NOTE If the printer control-panel display is blank, but the power-on checks pass, try printing an engine-test page to determine whether the problem is with the engine or display, or with the formatter.

- Perform the troubleshooting power-on checks. See Troubleshooting power-on in this chapter.
- When the control-panel display is fuctioning, go to step 2

2 Do any of the following messages appear on the control-panel display: **READY**, **OFFLINE**, or **POWERSAVER ON**? if yes, go to step 3. If no, then check the following items.

- Open the **SHOW EVENT LOG** in the **Diagnostics** menu from the control-panel display to view informatiom about recent printer errors. See View the event log on the control-panel display in this chapter.
- Does the LED blink at a constant rate? See LED diagnostics in this chapter.
- After correcting errors and performing the LED diagnostics, go to step 3.

3 Have you evaluated the event log? If yes, go to step 4. If no, then check the following items.

- Open the **PRINT EVENT LOG** in the **Diagnostics** menu from the control-panel display to show the last 50 printer errors. See Diagnostics menu in this chapter. If you experience jams while trying to print the event log, see Paper-path troubleshooting in this chapter
- Evaluate the event log. Look for reoccurring errors. After evualuating the event log, go to step 4.

4 Can you print a configuration page? See Configuration page in this chapter. If yes, go to step 5. If no, check the following items.

- Open the **SHOW EVENT LOG** in the **Diagnostics** menu from the control-panel display to view informatiom about a current printer error. See View the event log on the control-panel display in this chapter. Correct the error.
- After correcting the error, print a configuration page and verify the printer configuration information. See Configuration page in this chapter. Go to step 5.

5 Does the image quality meet the user's requirements? If yes, go to step 6. If no, check the following items.

- Print the print-quality troubleshooting pages. See Print-quality troubleshooting pages in this chapter.
- Solve the print-quality problems, and then go to step 6.

6 Can you successfully print from the computer that is directly connected to the printer or connected by a network? If yes, then this procedure is completed. If no, print a job from the computer that is directly connected to the printer or connected by a network. Perform the appropriate corrective actions.

Troubleshooting power-on

When you turn on the printer, if it does not make any sound or if the control-panel display is blank, check the following items:

1 Verify that the printer is plugged into an active electrical outlet that is of the correct voltage.

2 Verify that the on/off switch is in the ON position.

3 Make sure that the rear fan is running, which indicates that the system is operational.

4 Verify that the firmware DIMM (HP Color LaserJet 4600 models) or CompactFlash (HP Color LaserJet 4610n and 4650 models) and the formatter are seated and operating correctly.

5 Remove any HP Jetdirect or other EIO cards, and then try to turn the printer on again.

6 Make sure that the control-panel display is connected.

7 Check the fuses in the power supply.

8 If necessary, replace the power supply.

9 If necessary, replace the DC controller.

Printer-error troubleshooting

The following tables explain messages that might appear on the printer control panel. Alphabetical printer messages and their meanings are listed in alphabetical printer messages table in this chapter, and numerical printer messages are listed in numerical printer messages table in this chapter.

NOTE Not all of the messages are described in the tables. Self-explanatory messages are not listed. Some messages might never appear, depending on the printer model that you have. For example, messages that apply only to the HP Color LaserJet 4610n and 4650 models will not appear on the HP Color LaserJet 4600 models.

Status messages

Status messages reflect the current state of the printer. They inform you of normal printer operation and require no interaction to clear them. They change as the state of the printer changes. Whenever the printer is ready, not busy, and has no pending warning messages, the status message **Ready** appears if the printer is online.

Warning messages

Warning messages inform you of data and print errors. These messages typically alternate with **Ready** or with status messages, and they appear until ✓ is pressed. If **CLEARABLE WARNING** is set to **JOB** in the printer configuration menu, these messages are cleared by the next print job.

Error messages

Error messages communicate that some action must be performed, such as adding media or clearing a media jam.

Some error messages are auto-continuable; if **AUTO CONTINUE=ON** the printer will continue normal operation after an auto-continuable error message has appeared for 10 seconds.

NOTE Any button that is pressed during the 10-second appearance of an auto-continuable error message overrides the auto-continue feature, and the function of the pressed button takes precedence.

Critical error messages

Critical error messages inform you of a device failure. Some of these messages can be cleared by turning the printer off and then on. These messages are not affected by the auto-continue setting. If a critical error persists, service is required.

Alphabetical printer messages (HP Color LaserJet 4600 models)

NOTE Many of the procedures in this section instruct you to replace the DC controller PCA, the ETB, the formatter, the drum drive motors, the drum drive gears, or a laser/scanner unit. After replacing one of these items, you must access the Print Quality menu and select **CALIBRATE NOW** to ensure good print quality after the repair. When the ETB or the fuser are replaced before their normal end of life, access the resets menu and reset the counter to zero. See Calibrate Now (HP Color LaserJet 4600 models).

Table 7-2 Alphabetical printer messages (HP Color LaserJet 4600 models)

Message	Description	Action
Access denied **menus locked**	An attempt has been made to modify a menu item, but the printer administrator has enabled the control-panel security mechanism. The message will disappear shortly, and the printer will return to the **Ready** state.	Contact the printer administrator to change settings.
BAD OPTIONAL TRAY CONNECTION	The 500-sheet input tray is not making a sufficient connection with the printer.	1 Verify that the printer is on a level surface. 2 Turn the printer off. 3 Reseat the printer on the 500-sheet input tray. 4 If the printer is on the optional printer stand, make sure that the support straps are attached to the rear of the stand and the printer. 5 Turn the printer on after reseating the 500-sheet input tray.
CHOSEN PERSONALITY NOT AVAILABLE **For help press ?** alternates with **CHOSEN PERSONALITY NOT AVAILABLE** **To continue press** ✓	The PJL encountered a request for a personality that does not exist in the printer. The job is aborted and no pages are printed.	1 Press **?** for detailed information. 2 Press ▲ and ▼ to step through the instructions.
Clearing paper path	The printer jammed or detected misplaced paper when turned on. The printer is attempting to eject jammed pages automatically.	No action is necessary.
CLOSE FRONT COVERS **For help press ?**	The covers have to be closed.	1 Press **?** for more information. 2 Close the front covers.

Table 7-2 Alphabetical printer messages (HP Color LaserJet 4600 models) (continued)

Message	Description	Action
		NOTE This message might also appear if the fuser is missing or incorrectly installed. Ensure that the fuser is correctly installed.
CPR SENSOR **OUT OF RANGE**	The CPR Sensor is not behaving correctly.	1 Force a calibration by selecting **Calibrate Now** on the **Print Quality** menu. See Calibrate Now (HP Color LaserJet 4600 models). 2 If the message persists, verify that the cables are seated correctly and the connector J1024 is making good contact with the DC controller. 3 Replace the color-registration detection unit. 4 If the message persists, replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models).
DATA RECEIVED **To print last page press** ✓	The printer received data and is waiting for a form feed. When the printer receives another file, the message should disappear.	Press ✓ to continue.
DETECTABLE SIZE **IN TRAY xx** **For help press ?** alternates with **DETECTABLE SIZE IN TRAY xx** **Recommend move** **switch to STANDARD**	A tray has been loaded with media that is a standard size and the switch in the tray is set to custom.	1 Press **?** for detailed information. 2 Press ▲ and ▼ to step through the instructions.
DISK DEVICE **FAILURE** alternates with **Ready** **For menus press** ✓	A device failure has occurred on the specified drive.	1 Printing can continue for jobs that do not require access to the disk drive. 2 To clear the message, turn the printer off and then on. 3 If the message persists, remove and reinstall the EIO disk drive. 4 If the message persists, replace the EIO disk drive.

Table 7-2 Alphabetical printer messages (HP Color LaserJet 4600 models) (continued)

Message	Description	Action
DISK FILE **OPERATION FAILED** alternates with **Ready** **For menus press** ✓	The printer received a PJL file system command that attempted an illogical operation (for example, to download a file to a non-existent directory).	1 Printing can continue. 2 Turn the printer off and then on. 3 If the message reappears, a problem might exist with the software program.
DISK FILE **SYSTEM IS FULL** alternates with **Ready** **For menus press** ✓	The printer received a PJL file system command that attempted to store something on the file system. The attempt was unsuccessful because the file system is full.	1 Use the HP Web Jetadmin software to delete files from the EIO disk drive and then try again. 2 To remove this message from the control-panel display, turn the printer off and then on.
DISK IS **WRITE PROTECTED** alternates with **Ready** **For menus press** ✓	The file system device is protected and no new files can be written to it.	1 To enable writing to the disk, turn off write protection, by using HP Web Jetadmin. 2 To remove this message from the control-panel display, turn the printer off and then on.
EIO DISK x **NOT FUNCTIONAL** **For help press ?**	The EIO disk in slot x is not working correctly.	Remove the EIO disk from the indicated slot and replace it with a new EIO disk drive.
FLASH DEVICE **FAILURE** alternates with **Ready** **For menus press** ✓	A device failure has occurred on the specified drive.	1 Printing can continue for jobs that do not require the flash DIMM. 2 To remove this message from the control-panel display, turn the printer off and then on. 3 If the message persists, remove and reinstall the flash DIMM. 4 If the message persists, replace the flash DIMM.
FLASH FILE **OPERATION FAILED** alternates with	The printer received a PJL file system command that attempted an illogical operation (for example, to download a file to a non-existent directory).	1 Printing can continue. 2 Turn the printer off and then on. 3 If the message reappears, a problem might exist with the software program.

Table 7-2 Alphabetical printer messages (HP Color LaserJet 4600 models) (continued)

Message	Description	Action
Ready **For menus press** ✓		
FLASH FILE **SYSTEM IS FULL** alternates with **Ready** **For menus press** ✓	The printer received a PJL file system command that attempted to store something on the file system. The attempt was unsuccessful because the file system is full.	1 Use HP Web Jetadmin software to delete files from the flash memory and then try again. 2 To remove this message from the control-panel display, turn the printer off and then on.
FLASH IS **WRITE PROTECTED** alternates with **Ready** **For menus press** ✓	The file system device is protected and no new files can be written to it.	1 To enable writing to the flash memory, turn off write protection by using HP Web Jetadmin. 2 To remove this message from the control-panel display, turn the printer off and then on.
INCORRECT <COLOR> CARTRIDGE alternates with **For status press** ✓	An incorrect cartridge is installed in a slot and the cover is closed.	1 Press ✓ and then press **?** for help. 2 Press ▲ and ▼ to step through the instructions.
Incorrect PIN	The wrong PIN was typed.	Type the correct PIN. After three incorrect PIN entries, the printer returns to **Ready**.
INCORRECT SUPPLIES **For status press** ✓	At least one supply item is incorrectly positioned in the printer and another supply item is missing, incorrectly placed, out, or low.	1 Press ✓ and then press **?** for help. 2 Follow the instructions on the control-panel display to locate and replace the incorrect supply. 3 Press ▲ and ▼ to step through the instructions.
Initializing	This message appears when the printer is turned on, as soon as the individual tasks begin to initialize.	No action is necessary.
INSERT OR CLOSE **TRAY xx** **For help press ?**	Tray xx must be inserted or closed before the current job can be printed.	1 Press **?** for detailed information. 2 Press ▲ and ▼ to step through the instructions.

Table 7-2 Alphabetical printer messages (HP Color LaserJet 4600 models) (continued)

Message	Description	Action
INSTALL <COLOR> **CARTRIDGE** alternates with **For help press ?**	The cartridge is either not installed or not correctly installed in the printer.	1 Insert the cartridge or make sure that the cartridge is fully seated. 2 Press **?** for detailed information. 3 Press ▲ and ▼ to step through the instructions. 4 If the error persists, replace the cartridge. 5 Verify that the connectors between the memory tag antenna, memory controller board, and the DC controller are seated correctly. 6 Replace the antenna PCA for the indicated color. 7 Replace the memory controller PCA. 8 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models).
INSTALL FUSER **For help press ?**	The fuser is either not installed or not correctly installed in the printer.	1 Insert the fuser or make sure that the installed fuser is fully seated. 2 Press **?** for detailed information. 3 Press ▲ and ▼ to step through the instructions. 4 If the error persists, verify that fuser connector J4034 is good; replace the connector if necessary. 5 Replace the fuser assembly. 6 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models) .
INSTALL SUPPLIES **For status press ✓**	At least one supply item is missing or is not correctly seated in the printer and another supply item is missing, incorrectly placed, out, or low. Insert the supply item or make sure that the installed supply item is fully seated.	1 Press ✓ and then press **?** for help. 2 Follow the instructions on the control-panel display to locate and replace the missing or incorrect supply. 3 Press ▲ and ▼ to step through the instructions.

Table 7-2 Alphabetical printer messages (HP Color LaserJet 4600 models) (continued)

Message	Description	Action
INSTALL TRANSFER **UNIT** **For help press ?**	The transfer unit is either not installed or not correctly installed in the printer.	1 Insert the transfer unit or make sure the installed transfer unit is fully seated. 2 Press **?** for detailed information. 3 Press ▲ and ▼ to step through the instructions. 4 If the error persists, verify that the ETB connectors (J4017 on the ETB and J1014 on the DC controller PCA) are good. Replace the connectors as necessary. 5 Replace the ETB. 6 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models).
LOAD TRAY xx: **<TYPE> <SIZE>** **For help press ?** alternates with **LOAD TRAY xx:** **<TYPE> <SIZE>** **To use another** **tray press** ✓	Tray xx is either empty or configured for a type and size other than what is specified in the job.	1 Press **?** for detailed information. 2 Press ▲ and ▼ to step through the instructions.
LOAD TRAY xx: **<TYPE> <SIZE>** **For help press ?**	Tray xx is either empty or configured for a type and size other than what is specified in the job. No other tray is available.	1 Press **?** for detailed information. 2 Press ▲ and ▼ to step through the instructions.
MANUALLY FEED **<TYPE> <SIZE>** **For help press ?** alternates with **MANUALLY FEED** **<TYPE> <SIZE>** **To continue press** ✓	A job requires a specific paper type and size that is not currently available.	1 Press **?** for detailed information. 2 Press ▲ and ▼ to step through the instructions.

Table 7-2 Alphabetical printer messages (HP Color LaserJet 4600 models) (continued)

Message	Description	Action
If no paper in tray: **MANUALLY FEED** **<TYPE> <SIZE>** **For help press ?** alternates with **MANUALLY FEED** **<TYPE> <SIZE>** **To use another** **tray press** ✓	A job requires a specific paper type and size that is not currently available.	1 Press **?** for detailed information. 2 Press ▲ and ▼ to step through the instructions.
NON HP SUPPLY DETECTED	A new cartridge has been installed that is not made by HP. This message appears until an HP cartridge is installed or CANCEL JOB is pressed.	If you believe that the cartridge is an HP cartridge, please call the HP fraud hotline. Any printer repair that is required as a result of using non-HP cartridges is not covered under HP warranty. To continue printing, press CANCEL JOB. The first pending job will be cancelled. If the job does not print, try resending the job to the printer.
NON HP CARTRIDGE **IN USE** alternates with **Ready** **For menus press** ✓	The printer has detected that a non-HP print cartridge is currently installed.	If you believe that the cartridge is an HP cartridge, please call the HP fraud hotline. Any printer repair that is required as a result of using non-HP cartridges is not covered under HP warranty.
ORDER <COLOR> **CARTRIDGE** alternates with **To continue press** ✓	The identified print cartridge is nearing the end of its useful life and the **SUPPLIES LOW** setting in the **SYSTEM SETUP** submenu is set to **STOP**. Override the setting by pressing ✓.	1 Order the identified print cartridge. 2 Press ✓ to continue. 3 Press **?** for detailed information. 4 Press ▲ and ▼ to step through the instructions. 5 Supplies-ordering information is also available from the embedded Web server.

Table 7-2 Alphabetical printer messages (HP Color LaserJet 4600 models) (continued)

Message	Description	Action
ORDER <COLOR> **CARTRIDGE** alternates with **LESS THAN XXXX PAGES LEFT**	The identified print cartridge is near end of its life. The printer is ready and will continue for the estimated number of pages that appear.	1 Order the identified print cartridge. 2 The estimate of pages remaining is based upon historical page coverage for this printer. 3 Printing will continue until **REPLACE <COLOR> CARTRIDGE** appears. 4 Press **?** for detailed information. 5 Press ▲ and ▼ to step through the instructions. 6 Supplies-ordering information is also available from the embedded Web server.
ORDER FUSER KIT **LESS THAN XXXX PAGES LEFT** **To continue press** ✓	The fuser is near its end of life and the **SUPPLIES LOW** setting in the **SYSTEM SETUP** submenu is set to **STOP**.	1 Order the image fuser kit. 2 Press ✓ to continue printing. Printing can continue until the fuser reaches its end of life. 3 Supplies-ordering information is also available from the embedded Web server.
ORDER FUSER KIT **XXXX PAGES LEFT** **To enter menus press** ✓	The fuser is near its end of life. The printer is ready and will continue for the estimated number of pages that appears.	1 Order the image fuser kit. 2 Printing can continue until the fuser reaches its end of life. 3 Press **?** for detailed information. 4 Press ▲ and ▼ to step through the instructions. 5 Supplies-ordering information is also available from the embedded Web server.
ORDER SUPPLIES **For menus press** ✓	More than one supply item is low.	1 Press ✓ to identify which supplies should be ordered. 2 Order the identified supplies. 3 Printing can continue until supplies reach their end of life. 4 Press **?** for detailed information. 5 Press ▲ and ▼ to step through the instructions. 6 Supplies-ordering information is also available from the embedded Web server.

Table 7-2 Alphabetical printer messages (HP Color LaserJet 4600 models) (continued)

Message	Description	Action
ORDER SUPPLIES **For status press** ✓	More than one supply item is low and the **SUPPLIES LOW** setting in the **SYSTEM SETUP** submenus is set to **STOP**.	1 Press ✓ to identify which supplies should be ordered. 2 Order the identified supplies. 3 Press ✓ twice to continue printing. Printing can continue until supplies reach their end of life. 4 Supplies-ordering information is also available from the embedded Web server.
ORDER TRANSFER KIT **XXXX PAGES LEFT** **To continue press** ✓	The number of pages that remain for the transfer unit has reached the low threshold and the **SUPPLIES LOW** setting in the **SYSTEM SETUP** submenu is set to **STOP**.	1 Order the transfer kit. 2 Printing can continue until the transfer unit reaches its end of life. 3 Press **?** for detailed information. 4 Press ▲ and ▼ to step through the instructions. 5 Supplies-ordering information is also available from the embedded Web server.
ORDER TRANSFER KIT **LESS THAN XXXX PAGES LEFT** **To enter menus press** ✓	The transfer unit is near its end of life.	1 Order an image transfer kit. 2 Printing can continue until the transfer unit reaches its end of life. 3 Press **?** for detailed information. 4 Press ▲ and ▼ to step through the instructions. 5 Supplies ordering information is also available from the embedded Web server.
OUTPUT BIN FULL **Remove all paper** **from bin**	The output bin is full and must be emptied in order for printing to continue.	Remove media from the output bin.
Performing **PAPER PATH TEST**	The printer is performing a Paper Path test.	No action is necessary; however, the data is useful to help troubleshoot jams.
Performing upgrade	A firmware upgrade is in process.	No action is necessary.
Printing... **PQ TROUBLESHOOTING**	The printer is generating the print-quality troubleshooting pages. The printer will return to the **Ready** state when the pages are printed.	Follow the instructions on the printed pages.
Printing...	The printer is generating the registration page. The printer will return	Follow the instructions on the printed pages.

Table 7-2 Alphabetical printer messages (HP Color LaserJet 4600 models) (continued)

Message	Description	Action
REGISTRATION PAGE	to the **SET REGISTRATION** menu when the page is printed.	
Processing . . . **copy <X> of <Y>**	The printer is currently processing or printing collated copies. The message indicates that copy X of Y total copies is currently being processed.	No action is necessary.
Processing . . . **from tray XX**	The printer is actively processing a job from the indicated tray.	No action is necessary.
Processing duplex job **Do not grab paper** **until job completes**	Paper temporarily comes into the output bin while printing a duplex job. Do not attempt to remove the pages until the job is complete.	Do not grab paper when it comes into the output bin. The message disappears when the job is finished. You can then remove pages from the bin.
RAM DISK DEVICE **FAILURE** alternates with **Ready** **For menus press** ✓	A device failure has occurred on the specified drive.	Turn the printer off and then on to remove this message from the control-panel display.
RAM DISK FILE **OPERATION FAILED** alternates with **Ready** **For menus press** ✓	The printer received a PJL file system command that attempted an illogical operation (for example, to download a file to a non-existent directory).	1 Printing can continue. 2 Turn the printer off and then on to remove the message from the control-panel display. 3 If the message reappears, a problem might exist with the software program.
RAM DISK FILE **SYSTEM IS FULL** alternates with **Ready** **For menus press** ✓	The printer received a PJL file system command that attempted to store something on the file system. The attempt was unsuccessful because the file system is full.	Turn the printer off and then on to remove the message from the control-panel display. This will also delete any files saved in RAM.
RAM DISK IS **WRITE PROTECTED** alternates with **Ready** **For menus press** ✓	The file system device is protected and no new files can be written to it.	1 To enable writing to the RAM disk, turn off write protection by using HP Web Jetadmin software. 2 To remove this message from the control-panel display, turn the printer off and then on.

Table 7-2 Alphabetical printer messages (HP Color LaserJet 4600 models) (continued)

Message	Description	Action
Ready **Diagnostics mode** **To exit press Cancel Job button**		
Receiving **upgrade**	A firmware upgrade is in progress.	Do not turn the printer off until the printer returns to the **Ready** state.
REINSTALL <COLOR> CARTRIDGE alternates with **For help press ?**	The cartridge is not fully seated.	1 Press **?** for detailed information. 2 Press ▲ and ▼ to step through the instructions.
REMOVE ALL **PRINT CARTRIDGES** **To exit press** **Cancel Job key**	The printer is executing a Component test and the Belt only component is selected.	Remove all of the print cartridges.
REMOVE AT LEAST 1 **PRINT CARTRIDGE** **To exit press** **Cancel Job key**	The printer is executing a Disable cartridge check or Component test and Cartridge Motor component is selected.	Remove one print cartridge.
REPLACE <COLOR> **CARTRIDGE** alternates with **For help press ?**	The identified print cartridge has reached its end of life. Printing will not continue until the cartridge is replaced.	1 Replace the identified print cartridge to continue printing. 2 Press **?** for detailed information. 3 Press ▲ and ▼ to step through the instructions. 4 Supplies-ordering information is also available from the embedded Web server.
REPLACE FUSER KIT	The fuser kit is at its end of life.	1 Replace the fuser to continue printing. 2 Press **?** for detailed information. 3 Press ▲ and ▼ to step through the instructions. 4 Supplies-ordering information is also available from the embedded Web server.
REPLACE SUPPLIES **For status press ✓**	At least one supply item is out and needs to be replaced and another supply item is either out or low.	1 Press ✓ to identify which supplies should be replaced. 2 Replace the identified supplies to continue printing.

Table 7-2 Alphabetical printer messages (HP Color LaserJet 4600 models) (continued)

Message	Description	Action
		3 Press ? for detailed information. 4 Press ▲ and ▼ to step through the instructions. 5 Supplies-ordering information is also available from the embedded Web server.
REPLACE TRANSFER KIT **For help press ?**	The transfer unit has reached its end of life.	1 Replace the transfer unit to continue printing. 2 Press ? for detailed information. 3 Press ▲ and ▼ to step through the instructions. 4 Supplies-ordering information is also available from the embedded Web server.
Resend **upgrade**	The firmware upgrade was not completed successfully.	Attempt the upgrade again.
Rotating. . . **alienation motor** **To exit press** **CANCEL JOB**	The printer is testing the developing disengaging motor. (This motor is called the "alienation motor" in firmware messages.)	Press CANCEL JOB when you want to stop this test.
Rotating. . . **belt drive** **To exit press** **CANCEL JOB**	The printer is executing a Component Test and the **Belt Only** component is selected.	Press CANCEL JOB when you want to stop this test.
Rotating <color> **cartridge motor** **To exit press** **CANCEL JOB**	The printer is executing a Component Test and the **<color> Cartridge motor** component is selected.	Press CANCEL JOB when you want to stop this test.
Rotating. . . **fuser motor** **To exit press** **CANCEL JOB**	The printer is executing a Component test and the **Fuser Motor** component is selected.	Press CANCEL JOB when you want to stop this test.
Rotating <color> Laser Scanner **To exit press** **CANCEL JOB**	A scanner test is in progress.	Press CANCEL JOB when you want to stop this test.

Table 7-2 Alphabetical printer messages (HP Color LaserJet 4600 models) (continued)

Message	Description	Action
Rotating. . . **transfer motors** **To exit press** **CANCEL JOB**	The printer is executing a Component test and the **Transfer Motors** component is selected.	Press CANCEL JOB when you want to stop this test.
SIZE MISMATCH **TRAY xx= <SIZE>** **For help press ?** alternates with **Ready** **For menus press** ✓	The tray is loaded with media that is longer or shorter in the feed direction than the size that is configured for the tray.	1 Adjust the side and rear guides against the media. 2 If the media used is Letter, A4, Executive, B5 JIS, A5, or Legal size, the tray switch should be set to STANDARD. Set the tray switch to CUSTOM for all other media sizes. The tray switch must be set before the size can be selected from the control panel. 3 Reset the paper size in the paper-handling menu.
TRAY xx CONTAINS UNKNOWN MEDIA	The media type in the specified tray cannot be determined.	1 To change the media type, press ✓. Use ▲ and ▼ to highlight the type, and then press ✓ to select. 2 To change the media size to Letter, A4, Executive, B5 JIS, A5, or Legal, leave the tray switch in the STANDARD position. 3 To change the media size to other sizes, move the tray switch to CUSTOM, adjust the guides against the media, and close the tray. 4 Use ▲ and ▼ to highlight the media size, and then press ✓ to select.
TRAY xx EMPTY **<TYPE> <SIZE>** alternates with **Ready** **For menus press** ✓	The specified tray is empty and needs to be filled, but the current job does not need this tray to print correctly.	Refill the tray at a convenient time.
TRAY xx OPEN **For help press ?** alternates with	The specified tray is open or is not closed completely.	Close the tray.

Table 7-2 Alphabetical printer messages (HP Color LaserJet 4600 models) (continued)

Message	Description	Action
Ready **For menus press** ✓		
TRAY xx SIZE= **<XXXX SIZE>** **For help press ?** alternates with **TRAY xx SIZE=** **<XXXX SIZE>** **To change, move** **switch in tray xx**	An undetectable media size was selected from the menu and the tray switch is set to STANDARD. The size selected from the menu does not match the size that the tray detected. Size detection occurs when the tray switch is set in the STANDARD position.	1 Adjust the side and rear guides against the media. 2 If the media used is Letter, A4, Executive, B5 JIS, A5, or Legal size, the tray switch should be set to STANDARD. Set the tray switch to CUSTOM for all other media sizes. The tray switch must be set before the size can be selected from the control panel. 3 Reset the paper size in the paper-handling menu.
TRAY xx **<TYPE> <SIZE>** **Size detected by tray** alternates with **TRAY xx** **<TYPE> <SIZE>** **To change type** **press** ✓	The printer is reporting the current configuration of tray xx. The tray switch is in the STANDARD position.	1 To change the media type, press ✓. Use ▲ and ▼ to highlight the type, and then press ✓ to select. 2 To change the media size to Letter, A4, Executive, B5 JIS, A5, or Legal, leave the tray switch in the STANDARD position. 3 To change the media size to other sizes, move the tray switch to CUSTOM, adjust the guides against the media, and close the tray. 4 Use ▲ and ▼ to highlight the media size, and then press ✓ to select.
TRAY xx **<TYPE> <SIZE>** **Size specified by user** **alternates with** **TRAY xx** **<TYPE> <SIZE>** **To change type** **press** ✓	The printer is reporting the current configuration of tray xx. The tray switch is in the CUSTOM position.	1 To change the media type, press ✓. Use ▲ and ▼ to highlight the type, and then press ✓ to select. 2 To change the media size to Letter, A4, Executive, B5 JIS, A5, or Legal, set the tray switch to the STANDARD position and adjust the guides to the correct positions. 3 To change the media size to other sizes, leave the tray switch in the CUSTOM position, adjust the guides against the media, and close the tray.

Table 7-2 Alphabetical printer messages (HP Color LaserJet 4600 models) (continued)

Message	Description	Action
		4 Select the paper-handling menu from the control panel. Configure the size for the tray.
TYPE MISMATCH **TRAY xx= <TYPE>** alternates with **Ready** **To enter menus** **press** ✓	This warning appears after the printer has detected an overhead transparency in the paper path when the tray is configured for another type. This results in a 41.5 Unexpected Type in Tray xx error. The user did not reconfigure the tray after the error message appeared, so the printer determines that the type of media is not what the tray is configured to hold.	To change media type, press ✓. Use ▲ and ▼ to highlight the type, and then press ✓ to select a choice.
Unable to store job **<JOBNAME>**	A job cannot be stored because of a memory, disk, or configuration problem.	Install additional memory in the printer, or install a disk drive into the printer. If a disk drive is installed, delete any previously stored print jobs.
USE INSTEAD? **TRAY 2: <TYPE>** **<SIZE>** **TRAY 3: <TYPE>**	The printer is offering a selection of alternate media to use for the print job.	Highlight the media with ▲ and ▼. Press ✓ to select a choice.
Warming up	The printer is coming out of powersave mode. Printing will continue as soon as warmup is completed	

NOTE Not all messages are described in the tables; those messages that are not listed are self-explanatory.

Alphabetical printer messages (HP Color LaserJet 4610n and 4650 models)

NOTE Many of the procedures in this section instruct you to replace the DC controller PCA, the ETB, the formatter, the drum drive motors, the drum drive gears, or a laser/scanner unit. After replacing one of these items, you must access the Print Quality menu and select **QUICK CALIBRATE NOW**/**FULL CALIBRATE NOW** to ensure proper print quality after the repair. When the ETB or the fuser are replaced before their normal end of life, access the resets menu and reset the counter to zero. See Quick Calibrate Now (HP Color LaserJet 4610n and 4650 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).

Table 7-3 Alphabetical printer messages (HP Color LaserJet 4610n and 4650 models)

Message	Description	Action
Access denied **MENUS LOCKED**	An attempt has been made to modify a menu item, but the printer administrator has enabled the control-panel security mechanism. The message will disappear shortly, and the printer will return to the **READY** or **BUSY** state.	Contact the printer administrator to change settings.
BAD OPTIONAL TRAY CONNECTION	The 500-sheet input tray is not making a sufficient connection with the printer.	1 Verify that the printer is on a level surface. 2 Turn the printer off. 3 Reseat the printer on the 500-sheet input tray. 4 If the printer is on the optional printer stand, make sure that the support straps are attached to the rear of the stand and the printer. 5 Turn the printer on after reseating the 500-sheet input tray.
Calibrating	The printer is calibrating.	No action is necessary.
Canceling	The printer is in the process of canceling a job. The message will continue to appear while the job is stopped, the paper path flushed, and any remaining incoming data on the active data channel is received and discarded.	No action is necessary.
Checking paper path	The engine is turning its rollers to check for possible jams.	No action is necessary.
Checking printer	The engine is doing an internal test.	No action is necessary.
CHOSEN PERSONALITY NOT AVAILABLE **For help press ?** alternates with	The PJL encountered a request for a personality that does not exist in the printer. The job is aborted and no pages will be printed.	1 Press **?** for detailed information. 2 Press ▲ and ▼ to step through the instructions.

Table 7-3 Alphabetical printer messages (HP Color LaserJet 4610n and 4650 models) (continued)

Message	Description	Action
CHOSEN PERSONALITY NOT AVAILABLE **To continue press** ✓		
Clearing event log	This message appears while the event log is cleared. The printer will exit the menus after the event log has been cleared.	No action is necessary.
Clearing paper path	The printer jammed or detected misplaced media when it was turned on. The printer is attempting to eject jammed pages automatically.	No action is necessary.
CLOSE FRONT COVERS **For help press ?**	The covers have to be closed.	1 Press **?** for more information. 2 Close the front covers. **NOTE** This message might also appear if the fuser is missing or incorrectly installed. Ensure that the fuser is correctly installed.
CPR SENSOR **OUT OF RANGE**	The CPR Sensor is not behaving properly.	1 Force a calibration by selecting **Full Calibrate Now** on the **Print Quality** menu. See Full Calibrate Now (HP Color LaserJet 4610n and 4650 models). 2 If the message persists, verify the cables are seated correctly and the connector J1024 is making good contact with the DC controller. 3 Replace the color-registration detection unit. 4 If the message persists, replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).
DATA RECEIVED **To print last page press** ✓	The printer received data and is waiting for a form feed. When the printer receives another file, the message should disappear.	Press ✓ to continue.
Deleting. . . .	The printer is currently deleting the stored job.	No action is necessary.
DETECTABLE SIZE **IN TRAY xx** **For help press ?**	A tray has been loaded with media that is a standard size and the switch in the tray is set to custom.	1 Press **?** for detailed information. 2 Press ▲ and ▼ to step through the instructions.

Table 7-3 Alphabetical printer messages (HP Color LaserJet 4610n and 4650 models) (continued)

Message	Description	Action
alternates with **DETECTABLE SIZE IN TRAY xx** **Recommend move** **switch to STANDARD**		
DISK DEVICE **FAILURE** alternates with **Ready** **For menus press** ✓	A device failure has occurred on the specified drive.	1 Printing can continue for jobs that do not require access to the disk drive. 2 To clear the message, turn the printer off and then on. 3 If the message persists, remove and reinstall the EIO disk drive. 4 If the message persists, replace the EIO disk drive.
DISK DEVICE **OPERATION FAILED** **To clear press** ✓ alternates with **Ready**	The printer received a PJL file system command that attempted an illogical operation (for example, to download a file to a non-existent directory).	1 Printing can continue. 2 Turn the printer off and then on. 3 If the message reappears, a problem might exist with the software program.
DISK FILE **SYSTEM IS FULL** alternates with **To clear press** ✓ **Ready**	The printer received a PJL file system command that attempted to store something on the file system. The attempt was unsuccessful because the file system is full.	1 Use the HP Web Jetadmin software to delete files from the EIO disk drive and then try again. 2 To remove this message from the control-panel display, turn the printer off and then on.
DISK IS **WRITE PROTECTED** **To clear press** ✓ alternates with **Ready**	The file system device is protected and no new files can be written to it.	1 To enable writing to the disk, turn off write protection, by using HP Web Jetadmin. 2 To remove this message from the control-panel display, turn the printer off and then on.
EIO DISK X **Initializing**	The EIO disk device in slot X is initializing.	No action is necessary.
EIO DISK X **NOT FUNCTIONAL** **For help press ?**	The EIO disk device in slot X is not working correctly.	Remove the EIO disk from the indicated slot and it replace with a new EIO disk drive.

Table 7-3 Alphabetical printer messages (HP Color LaserJet 4610n and 4650 models) (continued)

Message	Description	Action
Event log empty	**SHOW EVENT LOG** was selected on the control-panel, and the event log is empty.	No action is necessary.
FLASH DEVICE **FAILURE** **To clear press** ✓ alternates with **Ready**	A device failure has occurred on the specified drive.	1 Printing can continue for jobs that do not require the Flash DIMM. 2 To remove this message from the control-panel display, turn the printer off and then on. 3 If the message persists, remove and reinstall the flash DIMM. 4 If the message persists, replace the flash DIMM.
Flash disk X **initializing** **Do not power off**	The new flash DIMM that is installed in slot X is initializing.	No action is necessary.
FLASH FILE **OPERATION FAILED** **To clear press** ✓ alternates with **Ready**	The printer received a PJL file system command that attempted an illogical operation (for example, to download a file to a non-existent directory).	1 Printing can continue. 2 Turn the printer off and then on. 3 If the message reappears, a problem might exist with the software program.
FLASH FILE **SYSTEM IS FULL** **To clear press** alternates with **Ready**	The printer received a PJL file system command that attempted to store something on the file system. The attempt was unsuccessful because the file system is full.	1 Use HP Web Jetadmin software to delete files from the flash memory and then try again. 2 To remove this message from the control-panel display, turn the printer off and then on.
FLASH IS **WRITE PROTECTED** **To clear press** ✓ alternates with **Ready**	The file system device is protected and no new files can be written to it.	1 To enable writing to the flash memory, turn off write protection, by using HP Web Jetadmin. 2 To remove this message from the control-panel display, turn the printer off and then on.
INCORRECT <COLOR> CARTRIDGE alternates with **For help press ?**	An incorrect cartridge is installed in a slot and the cover is closed. **NOTE** The supplies gauge shows the print cartridge consumption levels.	1 Press ✓ and then press **?** for help. 2 Press ▲ and ▼ to step through the instructions.

Table 7-3 Alphabetical printer messages (HP Color LaserJet 4610n and 4650 models) (continued)

Message	Description	Action
Incorrect	The wrong PIN was typed.	Type the correct PIN. After three incorrect PIN entries, the printer returns to **Ready**.
INCORRECT SUPPLIES **For status press** ✓	At least one supply item is incorrectly positioned in the printer and another supply item is missing, incorrectly placed, out, or low. **NOTE** The supplies gauge shows the print cartridge consumption levels.	1 Press ✓ and then press **?** for help. 2 Follow the instructions on the control-panel display to locate and replace the incorrect supply. 3 Press ▲ and ▼ to step through the instructions.
Initializing	This message appears when the printer is turned on, as soon as the individual tasks begin to initialize.	No action is necessary.
Initializing **permanent storage**	This message appears when the printer is turned on to show that permanent storage is being initialized.	No action is necessary.
INSERT OR CLOSE **TRAY XX** **For help press ?**	Tray XX must be inserted or closed before the current job can be printed.	1 Press **?** for detailed information. 2 Press ▲ and ▼ to step through the instructions.
INSTALL <COLOR> **CARTRIDGE** alternates with **For help press ?**	The cartridge is either not installed or not correctly installed in the printer. **NOTE** The supplies gauge shows the print cartridge consumption levels.	1 Insert the cartridge or make sure that the cartridge is fully seated. 2 Press **?** for detailed information. 3 Press ▲ and ▼ to step through the instructions. 4 If the error persists, replace the cartridge. 5 Verify that the connectors between the memory tag antenna, memory controller board, and the DC controller are seated correctly. 6 Replace the antenna PCA for the indicated color. 7 Replace the memory controller PCA. 8 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).
INSTALL FUSER **For help press ?**	The fuser is either not installed or not correctly installed in the printer.	1 Insert the fuser or make sure that the installed fuser is fully seated. 2 Press **?** for detailed information.

Table 7-3 Alphabetical printer messages (HP Color LaserJet 4610n and 4650 models) (continued)

Message	Description	Action
		3 Press ▲ and ▼ to step through the instructions. 4 If the error persists, verify that fuser connector J4034 is good. Replace that connector if necessary. 5 Replace the fuser assembly. 6 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).
INSTALL SUPPLIES **For status press** ✓	At least one supply item is missing or is not correctly seated in the printer and another supply item is missing, incorrectly placed, out, or low. Insert the supply item or make sure that the installed supply item is fully seated. **NOTE** The supplies gauge shows the print cartridge consumption levels.	1 Press ✓ and then press **?** for help. 2 Follow the instructions on the control-panel display to locate and replace the missing or incorrect supply. 3 Press ▲ and ▼ to step through the instructions.
INSTALL TRANSFER UNIT **For help press ?**	The transfer unit is either not installed or not correctly installed in the printer.	1 Insert the transfer unit or make sure that the installed transfer unit is fully seated. 2 Press **?** for detailed information. 3 Press ▲ and ▼ to step through the instructions. 4 If the error persists, verify that the ETB connectors (J4017 on the ETB and J1014 on the DC controller PCA) are good. Replace connectors as necessary. 5 Replace the ETB. 6 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).
LOAD TRAY XX: **<TYPE> <SIZE>** **For help press ?** alternates with	Tray XX is either empty or configured for a type and size other than what is specified in the job.	1 Press **?** for detailed information. 2 Press ▲ and ▼ to step through the instructions.

Table 7-3 Alphabetical printer messages (HP Color LaserJet 4610n and 4650 models) (continued)

Message	Description	Action
LOAD TRAY XX: **<TYPE> <SIZE>** **To use another** **tray press** ✓		
LOAD TRAY XX: **<TYPE> <SIZE>** **For help press ?** alternates with **LOAD TRAY XX:** **<TYPE> <SIZE>** **To continue press** ✓	Tray XX is either empty or configured for a type and size other than what is specified in the job.	1 Press **?** for detailed information. 2 Press ▲ and ▼ to step through the instructions.
LOAD TRAY XX: **<TYPE> <SIZE>** **For help press ?** **Move tray switch to custom** alternates with **LOAD TRAY XX:** **<TYPE> <SIZE>** **To use another** **tray press** ✓	Tray XX is either empty or configured for a type and size other than what is specified in the job. The size specified in the job requires that the tray switch be in the custom position.	1 Load the specified media into the tray. 2 Confirm that the guides are in the correct position. 3 Verify that the tray switch is in the custom position. 4 To use another tray, press ✓.
LOAD TRAY XX: **<TYPE> <SIZE>** **For help press ?** **Move tray switch to standard** alternates with **LOAD TRAY XX:** **<TYPE> <SIZE>** **To use another**	Tray XX is either empty or configured for a type and size other than what is specified in the job. The size specified in the job is a detectable size.	1 Load the specified media into the tray. 2 Confirm that the guides are in the correct position. 3 Verify that the tray switch is in the STANDARD position so that the printer will automatically detect the size.

Table 7-3 Alphabetical printer messages (HP Color LaserJet 4610n and 4650 models) (continued)

Message	Description	Action
tray press ✓		
LOAD TRAY XX: **<TYPE> <SIZE>** **Move tray switch to custom**	Tray XX is either empty or configured for a type and size other than what is specified in the job. The size specified in the job requires that the tray switch be in the custom position.	1 Load the specified media into the tray. 2 Confirm that the guides are in the correct position. 3 Verify that the tray switch is in the custom position.
LOAD TRAY xx: **<TYPE> <SIZE>** **Recommended move tray switch to standard**	Tray xx is either empty or configured for a type and size other than what is specified in the job. The size specified in the job is a detectable size.	1 Load the paper tray with the specified media. 2 Confirm that the guides are in the correct position. 3 Verify that the tray switch is in the STANDARD position so that the printer will automatically detect the size.
LOAD TRAY XX: **<TYPE> <SIZE>** **For help press ?**	Tray XX is either empty or configured for a type and size other than what is specified in the job. No other tray is available.	1 Press **?** for detailed information. 2 Press ▲ and ▼ to step through the instructions.
Loading program XX **Do not power off**	Programs and fonts can be stored in the printer file system. They are loaded into RAM when the printer is turned on. The XX specifies a sequence number that indicates the program that is being loaded.	No action is necessary.
MANUALLY FEED **<TYPE> <SIZE>** **For help press ?** alternates with **MANUALLY FEED** **<TYPE> <SIZE>** **To continue press** ✓	A job requires a specific paper type and size that is not currently available.	1 Press **?** for detailed information. 2 Press ▲ and ▼ to step through the instructions.
If no paper in tray: **MANUALLY FEED** **<TYPE> <SIZE>** **For help press ?**	A job requires a specific paper type and size that is not currently available.	1 Press **?** for detailed information. 2 Press ▲ and ▼ to step through the instructions.

Table 7-3 Alphabetical printer messages (HP Color LaserJet 4610n and 4650 models) (continued)

Message	Description	Action
alternates with **MANUALLY FEED** **<TYPE> <SIZE>** **To use another** **tray press** ✓		
MANUALLY FEED **<TYPE> <SIZE>** **For help press ?**	A job requires a specific paper type and size that is not currently available.	1 Press **?** for detailed information. 2 Press ▲ and ▼ to step through the instructions.
Moving solenoid **To exit press** **Stop key**	The printer is executing a Component Test and **Solenoid** is the component selected.	No action is necessary.
No job to cancel	The STOP button was pressed, but no active job or buffered data is available to cancel. This message appears for approximately two seconds before the printer returns to the **Ready** state.	No action is necessary.
NON HP CARTRIDGE DETECTED	A new cartridge has been installed that is not made by HP. This message appears until an HP cartridge is installed or STOP is pressed. **NOTE** The supplies gauge shows the print cartridge consumption levels.	If you believe the cartridge is an HP cartridge, please call the HP fraud hotline. Any printer repair that is required as a result of using non-HP cartridges is not covered under HP warranty. To continue printing, press STOP. The first pending job will be cancelled. If the job does not print, try resending the job to the printer.
NON HP SUPPLY **IN USE** alternates with **Ready**	The printer has detected that a non-HP print cartridge is currently installed. **NOTE** The supplies gauge shows the print cartridge consumption levels.	If you believe the cartridge is an HP cartridge, please call the HP fraud hotline. **CAUTION** Any printer repair that is required as a result of using non-HP cartridges is not covered under HP warranty.
OPTIONAL TRAYS **NOT SUPPORTED**	The printer detects that an optional sheet-feeder is installed.	The HP Color LaserJet 4610n printer does not support optional sheet-feeders. Remove any optional trays that might have been installed.

Table 7-3 Alphabetical printer messages (HP Color LaserJet 4610n and 4650 models) (continued)

Message	Description	Action
ORDER <COLOR> **CARTRIDGE** alternates with **Ready**	The identified print cartridge is near its end of life.	1 Order the identified print cartridge. 2 The estimated pages remaining is based upon historical page coverage for this printer. 3 Printing will continue until **REPLACE <COLOR> CARTRIDGE** appears. 4 Press **?** for detailed information. 5 Press ▲ and ▼ to step through the instructions. 6 Supplies-ordering information is also available from the embedded Web server.
ORDER FUSER KIT **LESS THAN XXXX PAGES** alternates with **Ready**	The fuser is near its end of life. The printer is ready and will continue for the estimated number of pages appears.	1 Order the image fuser kit. 2 Press **?** for detailed information. 3 Supplies-ordering information is also available from the embedded Web server.
ORDER SUPPLIES **For menus press** ✓ alternates with **Ready** **For help press ?**	More than one supply item is low. **NOTE** The supplies gauge shows the print cartridge consumption levels.	1 Press ✓ to identify which supplies should be ordered. 2 Order the identified supplies. 3 Printing can continue until supplies reach its end of life. 4 Press **?** for detailed information. 5 Press ▲ and ▼ to step through the instructions. 6 Supplies-ordering information is also available from the embedded Web server.
ORDER TRANSFER KIT **LESS THAN XXXX PAGES LEFT** For help press **?** alternates with **Ready**	The transfer unit is near its end of life.	1 Order an image transfer kit. 2 Printing can continue until the transfer unit reaches its end of life. 3 Press **?** for detailed information. 4 Press ▲ and ▼ to step through the instructions. 5 Supplies-ordering information is also available from the embedded Web server.

Table 7-3 Alphabetical printer messages (HP Color LaserJet 4610n and 4650 models) (continued)

Message	Description	Action
OUTPUT BIN FULL **Remove all paper** **from bin**	The output bin is full and must be emptied in order for printing to continue.	Remove media from the output bin.
Paused **To return to ready** **press STOP key**	The printer is paused, and no error messages are pending at the control-panel display. The I/O continues receiving data until the memory is full.	Press STOP.
Performing **PAPER PATH TEST**	The printer is performing a Paper Path test.	No action is necessary; however, the data is useful to help troubleshoot jams.
Performing **PRINT/STOP TEST**	The printer is performing a Print/Stop test.	No action is necessary.
Performing upgrade	A firmware upgrade is in process.	No action is necessary.
please wait	The printer is clearing data.	No action is necessary.
Powersave on	The printer is in Powersave mode. Any button pressed or error condition, or the receipt of printable data, clears the message.	No action is necessary.
Printing. . . **CMYK SAMPLES**	This message appears while the printer CMYK samples are generated.	No action is necessary.
Printing. . . **CONFIGURATION**	The printer is generating a configuration page. The printer will return to the **Ready** state when the page is completed.	No action is necessary.
Printing. . . **DEMO PAGE**	The printer is generating a demo page. The printer will return to the **Ready** state when the page is completed.	No action is necessary.
Printing. . . **EVENT LOG**	The printer is generating a event log page. The printer will return to the **Ready** state when the page is completed.	No action is necessary.
Printing. . . **FILE DIRECTORY**	The printer is generating a file directory page. The printer will return to the **Ready** state when the page is completed.	No action is necessary.
Printing. . . **FONT LIST**	The printer is generating a font list page. The printer will return to the **Ready** state when the page is completed.	No action is necessary.
Printing. . . **MENU MAP**	The printer is generating a menu map page. The printer will return to the **Ready** state when the page is completed.	No action is necessary.
Printing...	The printer is generating the print quality troubleshooting pages. The	Follow the instructions on the printed pages.

Table 7-3 Alphabetical printer messages (HP Color LaserJet 4610n and 4650 models) (continued)

Message	Description	Action
PQ TROUBLESHOOTING	printer will return to the **Ready** state when the pages are printed.	
Printing... **REGISTRATION PAGE**	The printer is generating the registration page. The printer will return to the **SET REGISTRATION** menu when the page is completed.	Follow the instructions on the printed pages.
Printing... **RGB SAMPLES**	This message appears while the printer RGB samples are generated.	No action is necessary.
Printing... **SUPPLIES STATUS**	The printer is generating a supplies status page. The printer will return to the **Ready** state when the page is completed.	No action is necessary.
Printing... **USAGE PAGE**	The printer is generating a usage page page. The printer will return to the **Ready** state when the page is completed.	No action is necessary.
Processing duplex job **Do not grab paper** **until job completes**	Paper temporarily comes into the output bin while printing a duplex job. Do not attempt to remove the pages until the job is complete.	Do not grab paper when it comes into the output bin. The message will disappear when the job is finished. You can then remove pages from the bin.
Processing. . .	The printer is currently processing a job but is not yet picking sheets. When paper motion begins, this message will be replaced by a message that indicates which tray the job is being printed from.	No action is necessary.
Processing. . . **copy <X> of <Y>**	The printer is currently processing or printing collated copies. The message indicates that copy X of Y total copies is currently being processed.	No action is necessary.
Processing. . . **from tray XX**	The printer is actively processing a job from the designated tray.	No action is necessary.
RAM DISK DEVICE **FAILURE** **To clear press** ✓ alternates with **Ready**	A device failure has occurred on the specified drive.	Turn the printer off and then on to remove this message from the display.
RAM DISK FILE **OPERATION FAILED** **To clear press** ✓	The printer received a PJL file system command that attempted an illogical operation (for example, to download a file to a non-existent directory).	1 Printing can continue. 2 Turn the printer off and then on to remove the message from the control-panel display. 3 If the message reappears, a problem might exist with the software program.

Table 7-3 Alphabetical printer messages (HP Color LaserJet 4610n and 4650 models) (continued)

Message	Description	Action
alternates with **Ready**		
RAM DISK FILE **SYSTEM IS FULL** **To clear press** ✓ alternates with **Ready**	The printer received a PJL file system command that attempted to store something on the file system. The attempt was unsuccessful because the file system is full.	Turn the printer off and then on to remove the message from the control-panel display. This will also delete any files saved in RAM.
RAM DISK IS **WRITE PROTECTED** **To clear press** ✓ alternates with **Ready**	The file system device is protected and no new files can be written to it.	1 To enable writing to the RAM disk, turn off write protection by using HP Web Jetadmin software. 2 To remove this message from the display, turn the printer off and then on.
Ready **Diagnostics mode** **To exit press Stop button**	The printer is in a special diagnostics mode.	Press STOP to exit the special diagnostics mode. OR No action is necessary.
Receiving **upgrade**	A firmware upgrade is in progress.	Do not turn the printer off until the printer returns to the **Ready** state.
REMOVE ALL **PRINT CARTRIDGES** **To exit press Stop button**	The printer is executing a Component test and the component selected is Belt only.	Remove all of the print cartridges.
REMOVE AT LEAST ONE **PRINT CARTRIDGE** **To exit press Stop button**	The printer is executing a Disable cartridge check or Component test where the Cartridge Motor is the component selected.	Remove one print cartridge.
REPLACE <COLOR> **CARTRIDGE** alternates with **For help press ?**	The identified print cartridge has reached its end of life. Printing will not continue until the cartridge is replaced. **NOTE** The supplies gauge shows the print cartridge consumption levels.	1 Replace the identified print cartridge to continue printing. 2 Press ? for detailed information. 3 Press ▲ and ▼ to step through the instructions. 4 Supplies-ordering information is also available from the embedded Web server.

Table 7-3 Alphabetical printer messages (HP Color LaserJet 4610n and 4650 models) (continued)

Message	Description	Action
REPLACE FUSER KIT **For help press ?**	The fuser kit is at its end of life.	1 Replace the fuser to continue printing. 2 Press ? for detailed information. 3 Press ▲ and ▼ to step through the instructions. 4 Supplies-ordering information is also available from the embedded Web server.
REPLACE SUPPLIES **For status press ✓**	At least one supply item is out and needs to be replaced and another supply item is either out or low. **NOTE** The supplies gauge shows the print cartridge consumption levels.	1 Press ✓ to identify which supplies should be replaced. 2 Replace the identified supplies to continue printing. 3 Press ? for detailed information. 4 Press ▲ and ▼ to step through the instructions. 5 Supplies-ordering information is also available from the embedded Web server.
REPLACE SUPPLIES **Printing black only** alternates with Ready For help press ?	At least one color supply item is out and needs to be replaced. Printing can continue, but only black toner will be used. **NOTE** The supplies gauge shows the print cartridge consumption levels.	1 Press ✓ to identify which supplies should be replaced. 2 Replace the identified supplies to continue printing. 3 Press ? for detailed information. 4 Press ▲ and ▼ to step through the instructions. 5 Supplies-ordering information is also available from the embedded Web server.
REPLACE TRANSFER KIT **For help press ?**	The transfer unit has reached end of life.	1 Replace the transfer unit to continue printing. 2 Press ? for detailed information. 3 Press ▲ and ▼ to step through the instructions. 4 Supplies ordering information is also available from the embedded Web server.
Request accepted **please wait**	The printer has accepted a request to print an internal page, but the current job must finish printing before the internal page can print.	No action is necessary.

Table 7-3 Alphabetical printer messages (HP Color LaserJet 4610n and 4650 models) (continued)

Message	Description	Action
Resend upgrade	The firmware upgrade was not completed successfully.	Attempt the upgrade again.
Resetting kit count	**YES** is selected in the **Reset Supplies** menu. Counts for any of the supplies that cannot be detected as new will be reset.	No action is necessary.
Restoring factory settings	The printer is restoring factory settings.	No action is necessary.
Restoring	The printer is restoring the last saved state.	No action is necessary.
Rotating motor **To exit press Stop button**	The printer is executing a Component Test and Motor is the component selected.	Press STOP when ready to stop this test.
Rotating. . . **belt drive** **To exit press Stop button**	The printer is executing a Component Test and the Belt Only is the component selected.	Press STOP when ready to stop this test.
Rotating <color> motor **To exit press Stop button**	A component test is in progress The component selected is the <color> Cartridge motor.	Press STOP when you want to stop this test.
Rotating. . . **fuser motor** **To exit press Stop button**	The printer is executing a Component test and the Fuser Motor is the component selected.	Press STOP when you want to stop this test.
Setting saved	A menu selection has been saved	No action is necessary.
SIZE MISMATCH **TRAY XX=<SIZE>** **For help press ?** alternates with **Ready**	The tray is loaded with media that is longer or shorter in the feed direction than the size that is configured for the tray.	1 Adjust the side and rear guides against the paper. 2 If the media used is Letter, A4, Executive, B5 JIS, A5, or Legal size, the tray switch should be set to STANDARD. Set the tray switch to CUSTOM for all other media sizes. The tray switch must be set before the size can be selected from the control panel. 3 Reset the paper size in the paper-handling menu.
TRAY XX EMPTY **<TYPE> <SIZE>** alternates with **Ready**	The specified tray is empty and needs to be filled, but the current job does not need this tray to print correctly.	Refill the tray at a convenient time.
TRAY XX OPEN	The specified tray is open or is not closed completely.	Close the tray.

Table 7-3 Alphabetical printer messages (HP Color LaserJet 4610n and 4650 models) (continued)

Message	Description	Action
For help press ? alternates with **Ready**		
TRAY XX SIZE= **< SIZE>** **Setting saved**	A non-detectable media size was selected from the menu and the tray switch is set to STANDARD. The size selected from the menu does not match the size detected by the tray. Size detection occurs when the tray switch is set in the STANDARD position.	1 Adjust the side and rear guides against the paper. 2 If the media used is Letter, A4, Executive, B5 JIS, A5, or Legal size, the tray switch should be set to STANDARD. Set the tray switch to CUSTOM for all other media sizes. The tray switch must be set before the size can be selected from the control panel. 3 Reset the paper size in the paper-handling menu.
TRAY XX SIZE= **< SIZE>** **Setting not saved** **To change size move guides in tray**	A non-detectable media size was selected from the menu and the tray switch is set to STANDARD. The size selected from the menu does not match the size detected by the tray. Size detection occurs when the tray switch is set in the STANDARD position.	1 Adjust the side and rear guides against the paper. 2 If the media used is Letter, A4, Executive, B5 JIS, A5, or Legal size, the tray switch should be set to STANDARD. Set the tray switch to CUSTOM for all other media sizes. The tray switch must be set before the size can be selected from the control panel. 3 Reset the paper size in the paper-handling menu.
TRAY XX SIZE= **< SIZE>** **Setting not saved** **To change move tray switch to CUSTOM**	A non-detectable media size was selected from the menu and the tray switch is set to STANDARD. The size selected from the menu does not match the size detected by the tray. Size detection occurs when the tray switch is set in the STANDARD position.	1 Adjust the side and rear guides against the paper. 2 If the media used is Letter, A4, Executive, B5 JIS, A5, or Legal size, the tray switch should be set to STANDARD. Set the tray switch to CUSTOM for all other media sizes. The tray switch must be set before the size can be selected from the control panel. 3 Reset the paper size in the paper-handling menu.

Table 7-3 Alphabetical printer messages (HP Color LaserJet 4610n and 4650 models) (continued)

Message	Description	Action
TRAY XX SIZE= **< SIZE>** **Setting saved** **To change move tray switch to STANDARD**	A non-detectable media size was selected from the menu and the tray switch is set to STANDARD. The size selected from the menu does not match the size detected by the tray. Size detection occurs when the tray switch is set in the STANDARD position.	1 Adjust the side and rear guides against the paper. 2 If the media used is Letter, A4, Executive, B5 JIS, A5, or Legal size, the tray switch should be set to STANDARD. Set the tray switch to CUSTOM for all other media sizes. The tray switch must be set before the size can be selected from the control panel. 3 Reset the paper size in the paper-handling menu.
TRAY XX SIZE= **< SIZE>** **Verify tray switch set to CUSTOM** **then close tray**	A non-detectable media size was selected from the menu and the tray switch is set to STANDARD. The size selected from the menu does not match the size detected by the tray. Size detection occurs when the tray switch is set in the STANDARD position.	1 Adjust the side and rear guides against the paper. 2 If the media used is Letter, A4, Executive, B5 JIS, A5, or Legal size, the tray switch should be set to STANDARD. Set the tray switch to CUSTOM for all other media sizes. The tray switch must be set before the size can be selected from the control panel. 3 Reset the paper size in the paper-handling menu.
TRAY XX SIZE= **< SIZE>** **Recommend move switch in tray to STANDARD** **then close tray**	A non-detectable media size was selected from the menu and the tray switch is set to STANDARD. The size selected from the menu does not match the size detected by the tray. Size detection occurs when the tray switch is set in the STANDARD position.	1 Adjust the side and rear guides against the paper. 2 If the media used is Letter, A4, Executive, B5 JIS, A5, or Legal size, the tray switch should be set to STANDARD. Set the tray switch to CUSTOM for all other media sizes. The tray switch must be set before the size can be selected from the control panel. 3 Reset the paper size in the paper-handling menu.
TRAY XX **<TYPE> <SIZE>** **Size detected by tray** alternates with **TRAY XX** **<TYPE> <SIZE>** **To change size or type**	The printer is reporting the current configuration of tray XX. The tray switch is in the STANDARD position.	1 To change the media type, press ✓. Use ▲ and ▼ to highlight the type, and then press ✓ to select. 2 To change the media size to Letter, A4, Executive, B5 JIS, A5, or Legal, leave the tray switch in the STANDARD position. 3 To change the media size to other sizes, move the tray switch to CUSTOM, adjust the guides

Table 7-3 Alphabetical printer messages (HP Color LaserJet 4610n and 4650 models) (continued)

Message	Description	Action
press ✓		against the media, and close the tray. 4 Use ▲ and ▼ to highlight the media size, and then press ✓ to select.
TRAY XX **<TYPE> <SIZE>** **Size specified by user** alternates with **TRAY XX** **<TYPE> <SIZE>** **To change size or type** **press** ✓	The printer is reporting the current configuration of tray XX. The tray switch is in the CUSTOM position.	1 To change media type, press ✓. Use ▲ and ▼ to highlight the type, and then press ✓ to select. 2 To change the media size to Letter, A4, Executive, B5 JIS, A5, or Legal, set the tray switch to the STANDARD position and adjust the guides to the correct positions. 3 To change the media size to other sizes, leave the tray switch in the CUSTOM position, adjust the media guides against the media, and close the tray. 4 Select the paper-handling menu from the control panel. Configure the size for the tray.
TYPE MISMATCH **TRAY XX= <TYPE>** **For help press ?** alternates with **Ready**	This warning appears after the printer has detected an overhead transparency in the paper path when the tray is configured for another type. This results In a 41.5 Unexpected Type in Tray xx error. The user did not reconfigure the tray after the error message appeared, so the printer determines that the type of media is not what the tray is configured to hold.	To change media type, press ✓. Use ▲ and ▼ to highlight the type, and then press ✓ to select.
Unable to mopy job **<JOBNAME>**	A mopy job cannot be mopied because of a memory, disk, or configuration problem. Only one copy will be printed.	No action is necessary.
Unable to store job **<JOBNAME>**	A job cannot be stored because of a memory, disk, or configuration problem.	Install additional memory in the printer, or install a disk drive into the printer. If a disk drive is installed, delete any previously stored print jobs.
USE TRAY XX **<TYPE><SIZE>** **To change press** ▲/▼ **To use press** ✓	The printer is offering a selection of alternate media to use for the print job.	Highlight the media with ▲ and ▼. Press ✓ to select a choice.
Wait for printer to reinitialize	RAM Disk settings have been changed before the printer automatically	No action is necessary.

Table 7-3 Alphabetical printer messages (HP Color LaserJet 4610n and 4650 models) (continued)

Message	Description	Action
	restarts, or external device modes have changed.	
Warming up	The printer is coming out of powersave mode. Printing will continue as soon as warmup is completed.	No action is necessary.

NOTE Not all messages are described in the tables; those messages that are not listed are self-explanatory.

Numerical printer messages (HP Color LaserJet 4600 models)

NOTE Many of the procedures in this section instruct you to replace the DC controller PCA, the ETB, the formatter, the drum drive motors, the drum drive gears, or a laser/scanner unit. After replacing one of these items, you must access the Print Quality menu and select **CALIBRATE NOW** to ensure proper print quality after the repair. When the ETB or the fuser are replaced before their normal end of life, access the resets menu and reset the counter to zero. See Calibrate Now (HP Color LaserJet 4600 models).

Table 7-4 Numerical printer messages (HP Color LaserJet 4600 models)

Message	Description	Action
10.XX.YY SUPPLIES **ERROR** **For help press ?** **NOTE** The printer cannot always determine whether the error is in the cartridge or with the printer reader/writer.	The printer cannot read or write to at least one print cartridge memory tag or at least one memory tag is missing. 10.00.00 black print cartridge 10.00.01 cyan print cartridge 10.00.02 magenta print cartridge 10.00.03 yellow print cartridge	1 Turn the printer off and then on. 2 Exchange the cartridge for the indicated color with a cartridge in another slot to determine whether the error follows the cartridge or stays with the slot. If the error follows the cartridge, replace that cartridge. Otherwise, continue with step 3. 3 Reseat the connectors between the memory PCA (J602-J605) and the antenna PCAs (J901A-D), the memory PCA, and the DC controller PCA (J1028). 4 Replace the antenna PCA. 5 Replace the memory PCA. 6 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models).
13.XX.YY.DUPLEX **JOB INTERRUPTED** **For help press ?** alternates with **13.XX.YY.DUPLEX** **JOB INTERRUPTED** **Discard top sheet** **and press** ✓ or **13.XX.YY.DUPLEX**	A duplex job was interrupted by interference as media passed through the output bin during duplexing.	1 Press ? for more information. 2 Remove one or two pages from the output bin as directed by the message on the control-panel display. 3 Press ✓ to continue printing. **NOTE** If **JAM RECOVERY = OFF**, some pages will not be reprinted. Resend the missing pages.

Table 7-4 Numerical printer messages (HP Color LaserJet 4600 models) (continued)

Message	Description	Action
JOB INTERRUPTED **Discard top two** **sheets and press** ✓		
13.XX.YY.JAM IN **DUPLEX PATH** **For help press ?**	A jam exists in the duplex path.	1 Press **?** for detailed information about clearing the jam. 2 Press ▲ and ▼ to step through the instructions. 3 Determine whether the ETB rollers or gears are worn or defective. Replace the ETB if they are. 4 Check the duplex feed guide, which is part of the control-panel crossmember assembly. If the guide is worn or damaged, replace the crossmember assembly.
13.XX.YY.JAM IN **PAPER INPUT PATH** **For help press ?**	A jam exists in the media input path.	1 Press **?** for detailed information about clearing the jam. 2 Press ▲ and ▼ to step through the instructions. 3 Check the registration shutter, and make sure that it is in place. Replace the paper pickup assembly if the shutter is damaged. 4 Check the paper pickup feed rollers, and replace them if they are worn or damaged. 5 Check the connectors, gears, solenoids, motors, and PCA on the paper pickup assembly. Replace the paper pickup assembly if necessary.
13.XX.YY JAM IN **PAPER PATH** **For help press ?**	There is a jam in the media path.	1 Press **?** for detailed information about clearing the jam. 2 Press ▲ and ▼ to step through the instructions. 3 If paper is folding into an accordion shape, check whether the shutter on each print cartridge opens as you close the ETB and each cartridge is turning correctly. Replace defective print cartridges or drive motors. 4 Clean the attaching roller at the bottom of the ETB and make sure that the spring is holding it in place.

Table 7-4 Numerical printer messages (HP Color LaserJet 4600 models) (continued)

Message	Description	Action
		5 If the attaching roller gears are defective, replace the ETB. Calibrate the printer after replacing the ETB. See Calibrate Now (HP Color LaserJet 4600 models). 6 Replace the paper pickup PCA. 7 Replace the ETB if it is not moving paper correctly. Calibrate the printer. 8 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models).
13.XX.YY.JAM IN **TRAY 1** **For help press ?**	A page is jammed in the multipurpose tray.	1 Press **?** for detailed information about clearing the jam. 2 Press ▲ and ▼ to step through the instructions. 3 Clean the pickup roller. If it is worn or damaged, replace it. 4 Clean or replace the separation pad. 5 Replace the tray 1 pickup solenoid. 6 Replace the tray 1 pickup motor. 7 Replace the paper pickup assembly. 8 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models).
13.XX.YY.JAM IN **TRAY 2** **For help press ?**	A page is jammed in tray 2.	1 Press **?** for detailed information about clearing the jam. 2 Press ▲ and ▼ to step through the instructions. 3 Clean the pickup roller. If it is worn or damaged, replace it. 4 Clean the feed roller. If it is worn or damaged, replace it. 5 Replace the tray 2 pickup solenoid. 6 Replace the tray 2 pickup motor. 7 Replace the paper pickup assembly. 8 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models).

Table 7-4 Numerical printer messages (HP Color LaserJet 4600 models) (continued)

Message	Description	Action
13.XX.YY.JAM IN **TRAY 3** **For help press ?**	A page is jammed in tray 3.	1 Press **?** for detailed information about clearing the jam. 2 Press ▲ and ▼ to step through the instructions. 3 Clean the pickup roller. If it is worn or damaged, replace it. 4 Clean the feed roller. If it is worn or damaged, replace it. 5 Replace the tray 3 pickup solenoid. 6 Replace the tray 3 pickup motor. 7 Replace the tray 3 paper feeder PCA. 8 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models).
13.20.00 JAM IN TOP **COVER AREA** **For help press ?**	A jam exists in the top-cover area.	1 Press **?** for detailed information about clearing the jam. 2 Press ▲ and ▼ to step through the instructions. 3 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models). 4 Replace the fuser. **WARNING!** The fuser might be hot. 5 Check that the fuser paper sensor is in place and is functioning correctly. If it is defective, replace it.
20 INSUFFICIENT **MEMORY** **For help press ?** alternates with **20 INSUFFICIENT** **MEMORY** **To continue** **press ✓**	The printer has received more data from the computer than fits in the available memory.	1 Press ✓ to resume printing. **NOTE** A loss of data will occur. 2 Reduce the complexity of the print job to avoid this error. 3 Adding memory to the printer may allow printing of more complex pages.

Table 7-4 Numerical printer messages (HP Color LaserJet 4600 models) (continued)

Message	Description	Action
22 EIO X **BUFFER OVERFLOW** **To continue** **press** ✓	The printer EIO card in slot X has overflowed its I/O buffer during a busy state.	Press ✓ to resume printing. **NOTE** A loss of data will occur.
22 PARALLEL I/O **BUFFER OVERFLOW** **For help press ?** alternates with **22 PARALLEL I/O** **BUFFER OVERFLOW** **To continue** **press** ✓	The printer parallel buffer has overflowed during a busy state.	Press ✓ to resume printing. **NOTE** A loss of data will occur.
40 EIO X BAD **TRANSMISSION** **To continue** **press** ✓	A connection with the card in EIO slot X has been broken abnormally.	1 Press ✓ to resume printing. **NOTE** A loss of data will occur. 2 Check that all cables are connected to the EIO ports and that the EIO board is seated properly. 3 If possible, print to another network printer to verify the network is working properly.
41.3 UNEXPECTED **SIZE IN TRAY XX** **For help press ?** alternates with **LOAD TRAY XX:** **[TYPE] [SIZE]** **For help press ?**	The media that is loaded is longer or shorter in the feed direction than the size that is configured for the tray.	1 If the incorrect size was selected, cancel the job or press ? for more information. 2 Press ▲ and ▼ to step through the instructions.
41.5 UNEXPECTED **TYPE IN TRAY XX** **For help press ?**	The printer senses a different media type in the media path than the type that is configured in the tray.	1 If the incorrect type was selected, cancel the job or press ? for more information. 2 Press ▲ and ▼ to step through the instructions.

Table 7-4 Numerical printer messages (HP Color LaserJet 4600 models) (continued)

Message	Description	Action
alternates with **LOAD TRAY XX:** **[TYPE] [SIZE]** **For help press ?**		
41.X **PRINTER ERROR** **For help press ?** alternates with **41.X** **PRINTER ERROR** **To continue** **press** ✓	A printer error has occurred. **X Description** 1 unknown misprint error 2 beam detect misprint error 3 media feed error (size) 4 no VSYNC error 5 media feed error (type) 6 ETB detection error 7 feed delay error 9 noise VSREQ	1 Press ✓ to continue or press **?** for more information. 2 If the message persists, turn the printer off and then on.
49.XXXX **PRINTER ERROR** **To continue** **turn off then on**	A critical firmware error has occurred that caused the processor on the formatter to abort operation. This type of error can be caused by invalid print commands, corrupt data, or invalid operations. In some cases, electrical noise in the cable can corrupt data during transmission to the printer. Other causes include poor-quality parallel cables, poor-connections, or home-grown programs. On rare occasions, the formatter is at fault, which is usually indicated by a **79 Service Error**.	1 Press CANCEL JOB to clear the print job from the printer memory. 2 Turn the printer off and then on. 3 Try printing a job from a different software program. If the job prints, go back to the first program and try printing a different file. If the message appears only with a certain software program or print job, contact the software vendor for assistance. 4 If the message persists with different software programs and print jobs, disconnect all of the cables to the printer that connect it to the network or computer. 5 Turn the printer off. 6 Remove all memory DIMMs or third-party DIMMs from the printer. (Do not remove the firmware DIMM in slot J1.) 7 Remove all EIO devices from the printer. 8 Turn the printer on. 9 If the error no longer exists, install each DIMM and EIO device one at a time,

Table 7-4 Numerical printer messages (HP Color LaserJet 4600 models) (continued)

Message	Description	Action
		making sure to turn the printer off and on again as you install each device. 10 Replace a DIMM or EIO device if you determine that it causes the error. 11 Remember to reconnect all of the cables that connect the printer to the network or computer. 12 If the error persists, replace the firmware DIMM. 13 Replace the formatter and calibrate the printer. See Calibrate Now (HP Color LaserJet 4600 models).
50.X FUSER ERROR **For help press ?**	A fuser error has occurred. **X Description** 1 low fuser temperature 2 fuser warmup service 3 high fuser temperature 4 faulty fuser 5 inconsistent fuser 6 open fuser 7 fuser pressure-release mechanism failure	1 Turn the printer off and allow it to cool down. 2 Reinstall the fuser, and check the connector J4034 that connects the fuser and the printer. Replace the connector if it is damaged. 3 Turn the printer off and remove the fuser. Measure the resistance between the connector pins on the fuser. If resistance does not meet the following guidelines, replace the fuser. • J4034-5 to J4034-6: 300 - 500 KOhms • J4034-1 to J4034-2: less than 1 KOhm 4 Check for continuity between connector pins J4034-4 and J4034-2. If no continuity exists, replace the fuser. 5 Replace the fuser power supply PCA. 6 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models).
51.XY **PRINTER ERROR** **For help press ?** alternates with **51.XY** **PRINTER ERROR**	A printer error has occurred. **X Description** 1 beam detect error 2 laser error **Y Description** 0 no color / black	1 Press ✓ to continue. 2 Turn the printer off and then on. 3 Reseat the connectors between the laser/scanner and DC controller PCA (J1009 - J1012). 4 Replace the defective laser/scanner assembly. Calibrate the printer after replacing the laser/scanner. See

Table 7-4 Numerical printer messages (HP Color LaserJet 4600 models) (continued)

Message	Description	Action
To continue **turn off then on**	1 cyan 2 magenta 3 yellow	Calibrate Now (HP Color LaserJet 4600 models). 5 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models).
52.XY **PRINTER ERROR** **For help press ?** alternates with **52.XY** **PRINTER ERROR** **To continue** **turn off then on**	A printer error has occurred. **X Description** 1 scanner error 2 scanner startup error 3 scanner rotation error **Y Description** 0 no color/black 1 cyan 2 magenta 3 yellow	1 Press ✓ to continue. 2 Turn the printer off and then on. 3 Reseat the connectors between the laser/scanner and DC controller PCA (J1009 - J1012). 4 Replace the defective laser/scanner assembly. Calibrate the printer after replacing the laser/scanner. See Calibrate Now (HP Color LaserJet 4600 models). 5 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models).
53.X0.ZZ **PRINTER ERROR** **To continue** **turn off then on**	An error has occurred in the on board RAM.	1 Press ✓ to continue. 2 Turn the printer off and then on.
53.XY.ZZ **CHECK RAM DIMM SLOT** **To continue press** **CANCEL JOB**	An error occurred in some printer memory. Values for X, Y, and Z are as follows: **X Device Location** 1 Slot 1 2 Slot 2 **Y Device Location** 1 DIMM Slot 1 2 DIMM Slot 2 3 DIMM Slot 3 4 DIMM Slot 4 **ZZ Error Number** 0 unsupported memory 1 unrecognized memory	**NOTE** The HP Color LaserJet 4610n printer has only one DIMM slot. 1 Turn the printer off. 2 Verify that all of the memory meets specifications and is correctly installed. 3 Turn the printer on. 4 If the problem persists, replace the memory device in the location indicated.

Table 7-4 Numerical printer messages (HP Color LaserJet 4600 models) (continued)

Message	Description	Action
	2 unsupported memory size 3 failed RAM test 4 exceeded maximum RAM size 5 invalid DIMM speed	
53.10.05 **PRINTER ERROR** **To continue** **turn off then on**	A DIMM is installed in both the 168-pin DIMM Slot 4 and the 100-pin DIMM Slot 5.	This is an invalid configuration. DIMMs can not be installed in both of these slots at the same time. Remove one of the DIMMs, or move one of the DIMMs to a different slot.
54.XX PRINTER ERROR	**X Description** 1 low fuser temperature 3 Dmax density sensor 5 CPR sensor 6 OHT sensor 7 yellow drum phase (home) position sensor 8 magenta drum phase (home) position sensor 9 cyan drum phase (home) position sensor 10 black drum phase (home) position sensor 11 yellow density sensor 12 magenta density sensor 13 cyan density sensor 14 black density sensor 15 yellow CPR sensor 16 magenta CPR sensor 17 cyan CPR sensor 18 black CPR sensor 19 ETB speed control sensor 20 color-plane-registration sensor 24 black toner-level sensor 1E or 30 half tone calibration error 01 humidity environmental sensor abnormal	Turn the printer off and then on, and then check the following items in the order listed. **54.1 error**: Check the fuser. See **50.X fuser error**. **54.3 error**: Check the connections. Replace the color registration detection assembly. **54.5 error**: Check the connections. Replace the color registration detection assembly. **54.6 error**: Check the connections. Replace the paper pickup unit. **54.7, 54.8, 54.9, or 54.10 error**: Check the connections. Replace the drum-phase sensor for the indicated color. **54.11, 54.12, 54.13, or 54.14 error**: Check the connections. Check the cartridge and replace it if necessary. Replace the color-registration detection assembly. **54.15, 54.16, 54.17, 54.18**: Check the connections. Replace the color-registration detection assembly. **54.19 error**: Check the ETB connection. Replace the ETB. Replace the DC controller. Calibrate the printer. See Calibrate Now (HP Color LaserJet 4600 models). **54.20 error**: Check the connection. Replace the color-registration detection assembly. **54.21, 54.22, 54.23, or 54.24 error**: Check the connections. Replace the toner-level sensing PCA. Replace the DC controller. Calibrate the printer. See Calibrate Now (HP Color LaserJet 4600 models).

Table 7-4 Numerical printer messages (HP Color LaserJet 4600 models) (continued)

Message	Description	Action
55.01.XY **DC CONTROLLER ERROR** **For help press ?** alternates with **55.X** **PRINTER ERROR** **To continue** **press** ✓	The DC controller is not communicating with the formatter. The problem could be caused by a timing error or an intermittent connection. **X Description** 0 communication error 1 DC controller memory error 2 outgoing party error 3 no engine response 4 communication timeout	1 Press ✓ to continue. 2 Turn the printer off and then on. 3 Reseat or replace the connectors between the DC controller and the formatter. 4 If the problem persists, replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models). 5 Replace the formatter. Initialize NVRAM. See NVRAM initialization.
56.XX **PRINTER ERROR** **To continue** **turn off then on**	A printer error has occurred. **XX Description** 01 illegal input 02 illegal output	Turn the printer off and then on again. If the error persists, record the message and contact support.
57.X **PRINTER ERROR** **To continue** **turn off then on**	A printer-fan error has occurred. **X Description** 3 cartridge fan (vertical fan, F2) 4 formatter fan (horizontal fan, F1)	Turn the printer off and then on. **57.3 Cartridge fan error (F2)** 1 Reconnect the connector J1004 on the DC controller PCA. 2 Immediately after starting the print operation, measure the voltage between pins 1 and 3 on the J1004 connector. If the voltage changes from 0 V to 24 V, replace the cartridge fan. 3 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models). **57.4 Formatter fan error (F1)** 1 Reconnect the connector J1003 on the DC controller PCA. 2 Immediately after turning the printer on, measure the voltage between pins 1 and 3 on the J1004 connector. If the voltage changes from 0 V to 24 V, replace the formatter fan. 3 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models).

Table 7-4 Numerical printer messages (HP Color LaserJet 4600 models) (continued)

Message	Description	Action
58.X **PRINTER ERROR** **For help press ?** alternates with **58.X** **PRINTER ERROR** **To continue** **turn off then on**	A memory tag error was detected. **X Description** 3 CPU 4 power supply	1 Turn the printer off and then on. 2 Replace the memory PCA. 3 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models).
59.XY **PRINTER ERROR** **For help press ?** alternates with **59.X Y** **PRINTER ERROR** **To continue** **turn off then on**	A printer motor error has occurred. **X Description** 0 motor error 1 motor startup error 2 motor rotation error 3 fuser motor startup error 4 fuser motor rotation error 5 print cartridge motor startup error 6 print cartridge motor rotation error 9 ETB motor startup error A ETB motor rotation error B developing disengaging motor startup error C developing disengaging motor rotation error **Y Description** 0 no color/Black 1 cyan 2 magenta 3 yellow	1 Turn the printer off and then on. 2 This message might also appear if the transfer unit is missing or incorrectly installed. Ensure that the transfer unit is correctly installed. **ETB motor error** 1 Clean the ETB unit intermediate connector, J4017. 2 Reconnect the connectors J4022 for the ETB motor, J4017 between the ETB and the printer, and J4014 on the DC controller PCA. 3 Replace the ETB motor. 4 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models). **Fuser motor error** 1 Reconnect the connectors J4030 for the fuser motor and J1002 on the DC controller PCA. 2 Replace the fuser drive assembly. 3 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models).

Table 7-4 Numerical printer messages (HP Color LaserJet 4600 models) (continued)

Message	Description	Action
		Print cartridge motor error 1 Reconnect the print cartridge connector on the DC controller PCA (J1013 for cyan, J1031 for magenta, J1032 for yellow, and J1033 for black). 2 Replace the drum drive assembly for the indicated print cartridge. 3 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models).
59.X Y continued		**Developing disengaging motor error** 1 Reconnect the connectors J4024 and J1019 between the developing disengaging motor and the DC controller PCA. 2 Replace the developing disengaging drive assembly. 3 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models).
62 NO SYSTEM **To continue** **turn off then on**	No system was found.	1 Turn the printer off and then on. 2 Reseat the firmware DIMM, making sure that it is in the 168-pin slot J1.
64 PRINTER ERROR **For help press ?** alternates with **64 PRINTER ERROR** **To continue** **turn off then on**	A scan buffer error occurred.	1 Turn the printer off and then on. 2 Perform a cold reset. 3 If the message persists, replace the formatter or firmware DIMM.
68.X PERMANENT **STORAGE ERROR** **For help press ?** alternates with **68.X PERMANENT**	One or more printer settings that were saved in the non-volatile storage device are invalid and have been reset to its factory default. Pressing ✓ should clear the message. Printing can continue, but unexpected behavior might occur. **X Description** 0 on board NVRAM	1 Press ✓ to continue. 2 Turn the printer off and then on. 3 Check the printer settings to determine which settings have been changed.

Table 7-4 Numerical printer messages (HP Color LaserJet 4600 models) (continued)

Message	Description	Action
STORAGE ERROR **To continue** **press** ✓	1 removable disk (flash or hard)	
68.X PERMANENT **STORAGE FULL** **For help press ?** alternates with **68.X PERMANENT** **STORAGE FULL** **To continue** **press** ✓	A non-volatile storage device is full. Pressing ✓ should clear the message. Printing can continue, but unexpected behavior might occur. **X Description** 0 on board NVRAM 1 removable disk (flash or hard)	1 Press ✓ to continue. 2 For **68.0** errors, turn the printer off and then on. 3 If a 68.0 error persists, perform an NVRAM intitialization. 4 For **68.1** errors, use the HP Web Jetadmin software to delete files from the disk drive. 5 If a 68.1 errors persists, reinitialize the hard disk.
68.X PERMANENT **STORAGE WRITE FAIL** **To continue press** ✓	A non-volatile storage device is failing to write. Pressing ✓ should clear the message. Printing can continue, but unexpected behavior might occur. **X Description** 0 on board NVRAM 1 removable disk (flash or hard)	1 Press ✓ to continue. 2 Turn the printer off and then on. 3 If the problem persists, initialize NVRAM. 4 Reinitialize the hard disk.
79.XXXX **PRINTER ERROR** **To continue** **turn off then on**	A critical hardware error has occurred.	1 Turn the printer off and then on. 2 If the problem persists, reseat the firmware DIMM. 3 Reseat the formatter. 4 Replace the firmware DIMM. 5 Replace the formatter. Calibrate the printer. See Calibrate Now (HP Color LaserJet 4600 models).
8X.YYYY **EIO ERROR**	The EIO accessory card in slot X has encountered a critical error.	1 Turn the printer off and then on. 2 If the problem persists, reseat the EIO card. 3 Replace the EIO card.

Numerical printer messages (HP Color LaserJet 4610n and 4650 models)

NOTE Many of the procedures in this section instruct you to replace the DC controller PCA, the ETB, the formatter, the drum drive motors, the drum drive gears, or a laser/scanner unit. After replacing one of these items, you must access the Print Quality menu and select **QUICK CALIBRATE NOW**/**FULL CALIBRATE NOW** to ensure proper print quality after the repair. When the ETB or the fuser are replaced before their normal end of life, access the resets menu and reset the counter to zero. See Quick Calibrate Now (HP Color LaserJet 4610n and 4650 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).

Table 7-5 Numerical printer messages (HP Color LaserJet 4610n and 4650 models)

Message	Description	Action
10.XX.YY SUPPLYY **MEMORY ERROR** alternates with **For help press ?**	The printer cannot read or write to at least one print cartridge memory tag or at least one memory tag is missing. 10.00.00 black print cartridge 10.00.01 cyan print cartridge 10.00.02 magenta print cartridge 10.00.03 yellow print cartridge **NOTE** The supplies gauge shows the print cartridge consumption levels.	1 Turn the printer off and then back on. 2 Press **?** for more information
10.10.YY SUPPLY **MEMORY ERROR** alternates with **For help press ?**	The printer cannot read or write to the print cartridge memory tag or the memory tag is missing. 10.10.00 black print cartridge 10.010.01 cyan print cartridge 10.10.02 magenta print cartridge 10.10.03 yellow print cartridge	1 Turn the printer off and then back on. 2 Exchange the cartridge for the indicated color with a cartridge in another slot to determine whether the error follows the cartridge or stays with the slot. If the error follows the cartridge, replace that cartridge. Otherwise, continue with step 3. 3 Reseat the connectors between the memory PCA (J602-J605) and the antenna PCAs (J901A-D), the memory

Table 7-5 Numerical printer messages (HP Color LaserJet 4610n and 4650 models) (continued)

Message	Description	Action
		PCA, and the DC controller PCA (J1028). 4 Replace the antenna PCA. 5 Replace the memory PCA. 6 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).
10.30.YY alternates with **For help press ?**	A non-HP print cartridge is installed. 10.30.00 black print cartridge 10.30.01 cyan print cartridge 10.30.02 magenta print cartridge 10.30.03 yellow print cartridge	1 Turn the printer off and then on. 2 Remove all of the print cartridges and turn the printer off and then on. 3 If the error persists, replace the indicated cartridge.
13.0A JAM IN **TOP COVER AREA** **For help press ?**	A jam exists in the top cover.	1 Press **?** for detailed information about clearing the jam. 2 Press ▲ and ▼ to step through the instructions.
13.02.00 JAM IN **Tray X** **For help press ?**	A page is jammed in tray 2, tray 3, or tray 4.	1 Press **?** for detailed information about clearing the jam. 2 Press ▲ and ▼ to step through the instructions. 3 Clean the pickup roller. If it is worn or damaged, replace it. 4 Clean the feed roller. If it is worn or damaged, replace it. 5 Replace the tray X pickup solenoid. 6 Replace the pickup motor.

Table 7-5 Numerical printer messages (HP Color LaserJet 4610n and 4650 models) (continued)

Message	Description	Action
		7 Replace the paper pickup assembly (for tray 2). 8 Replace the tray X paper feeder PCA (for the 500-sheet tray 3 or the 2 x 500-sheet feeder). 9 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).
13.05.00 JAM IN PAPER PATH **For help press ?**	A page has jammed in the media path.	1 Press **?** for detailed information about clearing the jam. 2 Press ▲ and ▼ to step through the instructions. 3 If paper is folding into an accordion shape, check whether the shutter on each print cartridge opens as you close the ETB and each cartridge is turning correctly. Replace defective print cartridges or drive motors. 4 Clean the attaching roller at the bottom of the ETB and make sure that the spring is holding it in place. 5 If the attaching roller gears are defective, replace the ETB. Calibrate the printer after replacing the ETB. See Full Calibrate Now (HP Color LaserJet 4610n and 4650 models). 6 Replace the paper pickup PCA. 7 Replace the ETB if it is not moving paper correctly. Calibrate the printer.

Table 7-5 Numerical printer messages (HP Color LaserJet 4610n and 4650 models) (continued)

Message	Description	Action
		8 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).
13.09.00 JAM IN **TOP COVER AREA** **For help press ?** alternates with **13.09.00 JAM IN** **TOP COVER AREA** **Then open and** **close top cover**	A page jammed as it entered the fuser.	1 Press **?** for detailed information about clearing the jam. 2 Press ▲ and ▼ to step through the instructions. 3 Check that the fuser paper sensor is in place and is functioning correctly. If it is defective, replace it. 4 Replace the fuser. ⚠ **WARNING!** The fuser might be hot. 5 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).
13.12.00.JAM IN **DUPLEX PATH** **For help press ?**	A jam exists in the duplex path.	1 Press **?** for detailed information about clearing the jam. 2 Press ▲ and ▼ to step through the instructions. 3 Determine whether the ETB rollers or gears are worn or defective. Replace the ETB if they are. 4 Check the duplex feed guide, which is part of the control-panel crossmember assembly. If the guide is worn or damaged, replace the crossmember assembly.

Table 7-5 Numerical printer messages (HP Color LaserJet 4610n and 4650 models) (continued)

Message	Description	Action
13.20.00 JAM IN **TOP COVER AREA** **For help press ?** alternates with **13.20.00 JAM IN** **TOP COVER AREA** **Then open and** **close top cover**	A page has jammed as it entered the fuser.	1 Press **?** for detailed information about clearing the jam. 2 Press ▲ and ▼ to step through the instructions. 3 Check that the fuser paper sensor is in place. If it is defective, replace it. 4 Replace the fuser. **WARNING!** The fuser might be hot. 5 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).
13.XX.YY.JAM IN **TRAY 1** **For help press ?**	A page is jammed in the multipurpose tray.	1 Press **?** for detailed information about clearing the jam. 2 Press ▲ and ▼ to step through the instructions. 3 Clean the pickup roller. If it is worn or damaged, replace it. 4 Clean or replace the separation pad. 5 Replace the tray 1 pickup solenoid. 6 Replace the tray 1 pickup motor. 7 Replace the paper pickup assembly. 8 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).

Table 7-5 Numerical printer messages (HP Color LaserJet 4610n and 4650 models) (continued)

Message	Description	Action
20 INSUFFICIENT MEMORY **For help press ?** alternates with **20 INSUFFICIENT MEMORY** **To continue press** ✓	The printer has received more data from the computer than fits in the available memory.	1 Press ✓ to resume printing (see the note below). 2 Reduce the complexity of the print job to avoid this error. 3 Adding memory to the printer may allow printing of more complex pages. **NOTE** A loss of data will occur.
22 EIO X BUFFER OVERFLOW **To continue press** ✓	The printer EIO card in slot X has overflowed its I/O buffer during a busy state.	Press ✓ to resume printing. **NOTE** A loss of data will occur.
22 PARALLEL I/O BUFFER OVERFLOW **For help press ?** alternates with **22 PARALLEL I/O BUFFER OVERFLOW** **To continue press** ✓	The printer parallel buffer has overflowed during a busy state.	Press ✓ to resume printing. **NOTE** A loss of data will occur.
22 SERIAL I/O BUFFER OVERFLOW **To continue press** ✓	The printer serial buffer has overflowed during a busy state.	Press ✓ to resume printing. **NOTE** A loss of data will occur.
40 BAD SERIAL TRANSMISSION **To continue press** ✓	A serial data error (parity, framing, or line overrun) has occurred while the printer was receiving data.	Press ✓ to resume printing. **NOTE** A loss of data will occur.

Table 7-5 Numerical printer messages (HP Color LaserJet 4610n and 4650 models) (continued)

Message	Description	Action
40 EIO X BAD **TRANSMISSION** **To continue** **press** ✓	A connection with the card in EIO slot X has been broken abnormally.	1 Press ✓ to resume printing (see note below). 2 Check that all cables are connected to the EIO ports and that the EIO board is seated properly. 3 If possible, print to another network printer to verify the network is working properly. **NOTE** A loss of data will occur.
41.3 UNEXPECTED **SIZE IN TRAY XX** **For help press ?** alternates with **LOAD TRAY XX:** **[TYPE] [SIZE]** **To use another tray press** ✓	The media that is loaded is longer or shorter in the feed direction than the size that is configured for the tray.	1 If the incorrect size was selected, cancel the job or press ? for more information. 2 Press ▲ and ▼ to step through the instructions.
41.5 UNEXPECTED **TYPE IN TRAY X** **For help press ?** alternates with **LOAD TRAY XX:** **[TYPE] [SIZE]** **To use another tray press** ✓	The printer senses a different media type in the media path than the type that is configured in the tray.	1 If the incorrect type was selected, cancel the job or press ? for more information. 2 Press ▲ and ▼ to step through the instructions.
41.X **PRINTER ERROR** **For help press ?** alternates with	A printer error has occurred. **X Description** 1 unknown misprint error 2 beam detect misprint error 3 media feed error (size)	1 Press ✓ to continue or press ? for more information. 2 If the message persists, turn the printer off and then on.

Table 7-5 Numerical printer messages (HP Color LaserJet 4610n and 4650 models) (continued)

Message	Description	Action
41.X **PRINTER ERROR** **To continue** **press** ✓	no VSYNC error 5 media feed error (type) 6 ETB detection error 7 feed delay error 9 noise VSREQ	
49.XXXX **PRINTER ERROR** **To continue** **turn off then on**	A critical firmware error has occurred that caused the processor on the formatter to abort operation. This type of error can be caused by invalid print commands, corrupt data, or invalid operations. In some cases, electrical noise in the cable can corrupt data during transmission to the printer. Other causes include poor-quality parallel cables, poor-connections, or home-grown programs. On rare occasions, the formatter is at fault, which is usually indicated by a 79 Service Error.	1 Press CANCEL JOB to clear the print job from the printer memory. 2 Turn the printer off and then on. 3 Try printing a job from a different software program. If the job prints, go back to the first program and try printing a different file. If the message appears only with a certain software program or print job, contact the software vendor for assistance. 4 If the message persists with different software programs and print jobs, disconnect all of the cables to the printer that connect it to the network or computer. 5 Turn the printer off. 6 Remove all memory DIMMs or third-party DIMMs from the printer. 7 Remove all EIO devices from the printer. 8 Turn the printer on. 9 If the error no longer exists, install each DIMM and EIO device one at a time, making sure to turn the printer off and on again as you install each device. 10 Replace a DIMM or EIO device if you determine that it causes the error.

Table 7-5 Numerical printer messages (HP Color LaserJet 4610n and 4650 models) (continued)

Message	Description	Action
		11 Remember to reconnect all of the cables that connect the printer to the network or computer. 12 If the error persists, replace the firmware DIMM. 13 Replace the formatter and calibrate the printer. See Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).
50.X FUSER ERROR **For help press ?**	A fuser error has occurred. **X Description** 1 low fuser temperature o 2 fuser warmup service 3 high fuser temperature 4 faulty fuser 5 inconsistent fuser 6 open fuser 7 fuser pressure-release mechanism failure	1 Turn the printer off and allow it to cool down. 2 Reinstall the fuser, and check the connector J4034 that connects the fuser and the printer. Replace the connector if it is damaged. 3 Turn the printer off and remove the fuser. Measure the resistance between the connector pins on the fuser. If resistance does not meet the following guidelines, replace the fuser. • J4034-5 to J4034-6: 300 - 500 KOhms • J4034-1 to J4034-2: less than 1 KOhm 4 Check for continuity between connector pins J4034-4 and J4034-2. If no continuity exists, replace the fuser. 5 Replace the fuser power supply PCA. 6 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).

Table 7-5 Numerical printer messages (HP Color LaserJet 4610n and 4650 models) (continued)

Message	Description	Action
51.XY **PRINTER ERROR** **For help press ?** alternates with **To continue** **turn off then on**	A printer error has occurred. **X Description** 1 beam detect error 2 laser error **Y Description** 0 no color/black 1 cyan 2 magenta 3 yellow	1 Press ✓ to continue. 2 Turn the printer off and then on. 3 Reseat the connectors between the laser/scanner and DC controller PCA (J1009 - J1012). 4 Replace the defective laser/scanner assembly. Calibrate the printer after replacing the laser/scanner. See Full Calibrate Now (HP Color LaserJet 4610n and 4650 models). 5 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).
52.XY **PRINTER ERROR** **For help press ?** alternates with **52.XY** **PRINTER ERROR** **To continue** **turn off then on**	A printer error has occurred. **X Description** 1 scanner error 2 scanner startup error 3 scanner rotation error **Y Description** 0 no color/black 1 cyan 2 magenta 3 yellow	1 Press ✓ to continue. 2 Turn the printer off and then on. 3 Reseat the connectors between the laser/scanner and DC controller PCA (J1009 - J1012). 4 Replace the defective laser/scanner assembly. Calibrate the printer after replacing the laser/scanner. See Full Calibrate Now (HP Color LaserJet 4610n and 4650 models). 5 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).

Table 7-5 Numerical printer messages (HP Color LaserJet 4610n and 4650 models) (continued)

Message	Description	Action
53.XY.ZZ **CHECK RAM DIMM SLOT** alternates with **To continue** **press Stop**	An error occurred in some printer memory. **X DIMM Type** 1 Slot 1 2 Slot 2 **Y Device Location** 1 DDR Slot 1 2 DDR Slot 2 **ZZ Error Number** 0 unsupported memory 1 unrecognized memory 2 unsupported memory size 3 failed RAM test 4 exceeded maximum RAM size 5 invalid DDR speed	**NOTE** The HP Color LaserJet 4610n printer has only one DIMM slot. 1 Turn the printer off. 2 Verify that the memory meets specifications and is correctly installed. 3 Turn the printer on. 4 If the problem persists, replace the DDR card in the slot indicated.
54.X PRINTER ERROR	**X Description** 1 low fuser temperature 3 Dmax density sensor 5 CPR sensor 6 OHT sensor 7 yellow drum phase (home) position sensor 8 magenta drum phase (home) position sensor 9 cyan drum phase (home) position sensor 10 black drum phase (home) position sensor 11 yellow density sensor 12 magenta density sensor 13 cyan density sensor 14 black density sensor 15 yellow CPR sensor 16 magenta CPR sensor	Turn the printer off and then on, and then check the following items in the order listed. **54.1 error**: Check the fuser. See **50.X fuser error**. **54.3 error**: Check the connections. Replace the color registration detection assembly. **54.5 error**: Check the connections. Replace the color registration detection assembly. **54.6 error**: Check the connections. Replace the paper pickup unit. **54.7, 54.8, 54.9, or 54.10 error**: Check the connections. Replace the drum-phase sensor for the indicated color. **54.11, 54.12, 54.13, or 54.14 error**: Check the connections. Check the cartridge and replace it if

Table 7-5 Numerical printer messages (HP Color LaserJet 4610n and 4650 models) (continued)

Message	Description	Action
	17 cyan CPR sensor 18 black CPR sensor 19 ETB speed control sensor 20 color-plane-registration sensor 21 black toner-level sensor 1E or 30 halftone calibration error 01 humidity environmental sensor abnormal	necessary. Replace the color-registration detection assembly. **54.15, 54.16, 54.17, 54.18**: Check the connections. Replace the color registration detection assembly. **54.19 error**: Check the ETB connection. Replace the ETB. Replace the DC controller. Calibrate the printer. See Full Calibrate Now (HP Color LaserJet 4610n and 4650 models). **54.20 error**: Check the connection. Replace the color-registration detection assembly. **54.21, 54.22, 54.23, or 54.24 error**: Check the connections. Replace the toner-level sensing PCA. Replace the DC controller. Calibrate the printer. See Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).
54.XX.00 **PRINTER ERROR** **To continue turn** **off then on**	Printing cannot continue. The CPR sensor out of range. **X values** 15 = yellow 16 = magenta 17 = cyan 18 = black	1 For step-by-step information, press ✓ 2 Turn the printer off and then on.
54.20.00 **PRINTER ERROR** **To continue turn** **off then on**	Printing cannot continue. The CPR sensor out of range.	1 For step-by-step information, press ✓ 2 Turn the printer off and then on.
55.01.XY **DC CONTROLLER ERROR** **For help press ?** alternates with	The DC controller is not communicating with the formatter. The problem could be caused by a timing error or an intermittent connection. **X Description**	1 Press ✓ to continue. 2 Turn the printer off and then on. 3 Reseat or replace the connectors between the

Table 7-5 Numerical printer messages (HP Color LaserJet 4610n and 4650 models) (continued)

Message	Description	Action
55.X **PRINTER ERROR** **To continue** **turn off then on**	0 communication error 1 DC controller memory error 2 outgoing party error 3 no engine response 4 communication timeout	DC controller and the formatter. 4 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Full Calibrate Now (HP Color LaserJet 4610n and 4650 models). 5 Replace the formatter. Initialize NVRAM. See NVRAM initialization.
56.XX **PRINTER ERROR** **To continue** **turn off then on**	A printer error has occurred. **XX Description** 01 illegal input 02 illegal output	Turn the printer off then on again. If the error persists, record the message and call support.
57.X **PRINTER ERROR** **To continue** **turn off then on**	A printer-fan error has occurred. **X Description** 3 cartridge fan (vertical fan, F2) 4 formatter fan (horizontal fan, F1) 7 power supply fan (F3; HP Color LaserJet 4650 models)	Turn the printer off and then on. **57.3 Cartridge fan error (F2)** 1 Reconnect the connector J1004 on the DC controller PCA. 2 Immediately after starting the print operation, measure the voltage between pins 1 and 3 on the J1004 connector. If the voltage changes from 0 V to 24 V, replace the cartridge fan. 3 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).

Table 7-5 Numerical printer messages (HP Color LaserJet 4610n and 4650 models) (continued)

Message	Description	Action
		57.4 Formatter fan error (F1) 1 Reconnect the connector J1003 on the DC controller PCA. 2 Immediately after turning the printer on, measure the voltage between pins 1 and 3 on the J1004 connector. If the voltage changes from 0 V to 24 V, replace the formatter fan. 3 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Full Calibrate Now (HP Color LaserJet 4610n and 4650 models). **57.5 Power-supply fan error (F3)** (HP Color LaserJet 4650 models) 1 Reconnect the connector J1037 on the DC controller PCA. 2 Immediately after turning the printer on, measure the voltage between pins 1 and 3 on the J1037 connector. If the voltage changes from 0 V to 24 V, replace the power-supply fan. 3 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).
58.X **PRINTER ERROR** **For help press ?** alternates with	A memory tag error was detected. **X Description** 2 air-temperature sensor 3 CPU	1 Turn the printer off and then on. 2 Replace the memory PCA. 3 Replace the DC controller PCA. Calibrate the printer

Table 7-5 Numerical printer messages (HP Color LaserJet 4610n and 4650 models) (continued)

Message	Description	Action
58.X **PRINTER ERROR** **To continue** **turn off then on**	4 power supply	after replacing the DC controller. See Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).
59.XY **PRINTER ERROR** **For help press ?** alternates with **59.X Y** **PRINTER ERROR** **To continue** **turn off then on**	A printer motor error has occurred. **X Description** 0 motor error 1 motor startup error 2 motor rotation error 3 fuser motor startup error 4 fuser motor rotation error 5 print cartridge motor startup error 6 print cartridge motor rotation error 9 ETB motor startup error A ETB motor rotation error B developing disengaging motor startup error C developing disengaging motor rotation error **Y Description** 0 no color/black 1 cyan 2 magenta 3 yellow	1 Turn the printer off and then on. 2 This message might also appear if the transfer unit is missing or incorrectly installed. Ensure that the transfer unit is correctly installed. **ETB motor error** 1 Clean the ETB unit intermediate connector, J4017. . 2 Reconnect the connectors J4022 for the ETB motor, J4017 between the ETB and the printer, and J4014 on the DC controller PCA. 3 Replace the ETB motor. 4 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Full Calibrate Now (HP Color LaserJet 4610n and 4650 models). **Fuser motor error** 1 Reconnect the connectors J4030 for the fuser motor and J1002 on the DC controller PCA. 2 Replace the fuser drive assembly. 3 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).

Table 7-5 Numerical printer messages (HP Color LaserJet 4610n and 4650 models) (continued)

Message	Description	Action
		Print cartridge motor error 1 Reconnect the print cartridge connector on the DC controller PCA (J1013 for cyan, J1031 for magenta, J1032 for yellow, and J1033 for black). 2 Replace the drum drive assembly for the indicated print cartridge. 3 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Full Calibrate Now (HP Color LaserJet 4610n and 4650 models). **Developing-disengaging motor error** 1 Reconnect the connectors J4024 and J1019 between the developing-disengaging motor and the DC controller PCA. 2 Replace the developing-disengaging drive assembly. 3 Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).
62 NO SYSTEM **To continue** **turn off then on**	No system was found.	1 Turn the printer off and then on. 2 Reseat the firmware DIMM.
68.X STORAGE ERROR **SETTING CHANGE** **For help press ?** alternates with	One or more printer settings that were saved in the non-volatile storage device are invalid and have been reset to its factory default. Pressing ✓ should clear the message. Printing can	1 Press ✓ to continue. 2 Turn the printer off and then back on. 3 Check the printer settings to determine

Table 7-5 Numerical printer messages (HP Color LaserJet 4610n and 4650 models) (continued)

Message	Description	Action
68.X STORAGE ERROR **SETTING CHANGE** **To continue** **press** ✓	continue, but unexpected behavior might occur. **X Description** 0 on board NVRAM 1 removable disk (flash or hard)	which settings have been changed.
68.X PERMANENT **STORAGE FULL** **For help press ?** alternates with **68.X PERMANENT** **STORAGE FULL** **To continue** **press** ✓	A non-volatile storage device is full. Pressing ✓ should clear the message. Printing can continue, but unexpected behavior might occur. **X Description** 0 on board NVRAM 1 removable disk (flash or hard)	1 Press ✓ to continue. 2 For **68.0** errors, turn the printer off and then on. 3 If a 68.0 error persists, perform an NVRAM inititialization. 4 For **68.1** errors, use the HP Web Jetadmin software to delete files from the disk drive. 5 If a 68.1 errors persists, reinitialize the hard disk. **NOTE** The removable hard disk is not available for the HP Color LaserJet 4610n printer.
68.X PERMANENT **STORAGE WRITE FAIL** **To continue press** ✓	A non-volatile storage device is failing to write. Pressing ✓ should clear the message. Printing can continue, but unexpected behavior might occur. **X Description** 0 on board NVRAM 1 removable disk (flash or hard)	1 Press ✓ to continue. 2 Turn the printer off and then on. 3 If the problem persists, initialize NVRAM. 4 Reinitialize the hard disk.
79.XXXX **PRINTER ERROR** **To continue** **turn off then on**	A critical hardware error has occurred.	1 Turn the printer off and then on. 2 If the problem persists, reseat the firmware DIMM. 3 Reseat the formatter. 4 Replace the firmware DIMM.

Table 7-5 Numerical printer messages (HP Color LaserJet 4610n and 4650 models) (continued)

Message	Description	Action
		5 Replace the formatter. Calibrate the printer. See Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).
8X.YYYY **EIO ERROR**	The EIO accessory card in slot X has encountered a critical error. 81 EIO ERROR = error in slot 1 82 EIO ERROR = error in slot 2	1 Turn the printer off and then on. 2 If the problem persists, reseat the EIO card. 3 Replace the EIO card.

Replacement-parts configuration (HP Color LaserJet 4610n and 4650 models)

When the following parts are replaced, perform the procedures in this section.

- Formatter *and* DC controller
- Formatter (new or previously installed in another printer)
- DC controller (new or previously installed in another printer)

NOTE The HP Color LaserJet 4610n and 4650 models store printer-configuration information in the flash memory. Always print a configuration page before and after installing the formatter or DC controller to verify that the printer configuration information is restored from the CompactFlash memory to the NVRAM. Wait five minutes after the printer power is turned on before printing the after installation configuration page.

Formatter *and* DC controller

WARNING! Do *not* replace the formatter and the DC controller at the same time. If the formatter and DC controller must both be replaced, install a replacement formatter first and make sure that you install the CompactFlash memory from the removed formatter on the replacement formatter *before* you turn the printer power on.

If the formatter and DC controller both need to be replaced, install a replacement formatter first. The HP Color LaserJet 4610n and 4650 models store printer-configuration information in the flash memory. The flash memory from the removed formatter *must* be installed on the replacement formatter, so that the printer-configuration information (for example, the duplexing option, page counts, and serial number) can be restored to the formatter and the DC controller. After replacing the formatter and installing the flash memory, turn the printer power on. When the **READY** message appears on the control-panel display, you *must* wait five minutes before using the printer so that the printer-configuration information can be restored from the flash memory to the NVRAM.

After completing the preceding procedure, turn the printer power off and replace the DC controller. Turn the printer power on. When the **READY** message appears on the control-panel display, wait five minutes before using the printer so that the printer-configuration information can be restored from the flash memory to the NVRAM.

After installing the replacement formatter and DC controller, perform a full calibration procedure three times. See Quick Calibrate Now (HP Color LaserJet 4610n and 4650 models).

Formatter (new or previously installed in another printer)

The HP Color LaserJet 4610n and 4650 models store printer-configuration information in the flash memory. The flash memory from the removed formatter *must* be installed on the replacement formatter, so that the printer-configuration information (for example, the duplexing option, page counts, and serial number) can be restored to the formatter and the DC controller. After replacing the formatter and installing the flash memory, turn the printer power on. When the **READY** message appears on the control-panel display, you *must* wait five minutes before using the printer so that the printer-configuration information can be restored from the flash memory to the NVRAM.

NOTE The transfer kit page count is *not* reset by replacing the formatter.

After installing the replacement formatter, perform a full calibration procedure three times. See Quick Calibrate Now (HP Color LaserJet 4610n and 4650 models).

DC Controller (new or previously installed in another printer)

After replacing the DC controller, turn the printer power on. When the **READY** message appears on the control-panel display, you *must* wait five minutes before using the printer so that the printer configuration information (for example, the duplexing option, page counts, and serial number) can be restored from the CompactFlash memory to the NVRAM.

After installing the replacement DC controller, perform a quick calibration procedure three times. See Quick Calibrate Now (HP Color LaserJet 4610n and 4650 models).

Paper-path troubleshooting

Use the information in this section to troubleshoot errors in the printer paper path.

Jams

Jam error messages occur if media fails to arrive at or clear the paper-path sensors in the allowed time. Dedicated paper sensors detect whether media is present in the sensor and whether media is feeding normally. When the DC controller detects a jam, it immediately stops the printing process and the appropriate jam message appears for the sensor that detects the jam. Sensors shows the locations of all the sensors in the printer.

Jam locations

Jams occur in the areas shown in Figure 7-1 Jam locations (HP Color LaserJet 4600 Series printer). Jam messages correlate with these areas. For instructions about clearing jams, see the sections later in this chapter.

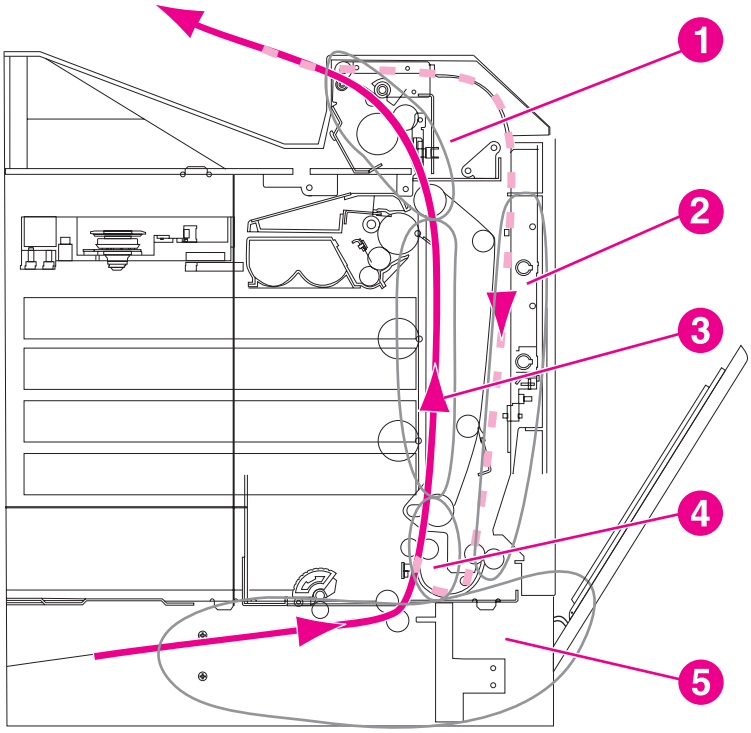


Figure 7-1 Jam locations (HP Color LaserJet 4600 Series printer)

1	Top cover area
2	Duplex path
3	Paper path
4	Paper input path
5	Trays

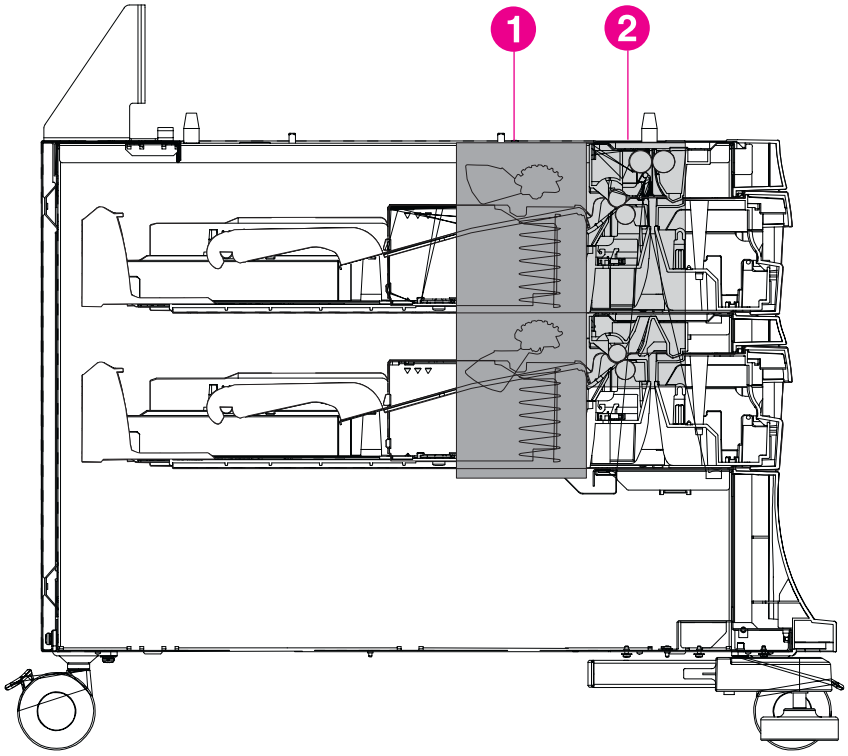


Figure 7-2 2 x 500-sheet feeder (HP Color LaserJet 4650 models only)

1	Pickup area
2	Paper feed area

Jam locations by error message

Use Table 7-6 Error messages and associated jam locations table to identify jam locations and to help pinpoint and clear specific paper jams. See Figure 7-1 Jam locations (HP Color LaserJet 4600 Series printer) or Figure 7-2 2 x 500-sheet feeder (HP Color LaserJet 4650 models only) for jam locations.

Table 7-6 Error messages and associated jam locations

Error message	Jam location	Action
13.01.00 JAM IN TRAY x	5; printer	A 13.01.00 jam occurs when the paper is late in arriving at the paper leading-edge sensor (PS3) in the paper pickup assembly. This event could be a no pick resulting in the absence of media in the paper path, or could be a sheet that was delayed and jammed somewhere in the feed area between the specified tray and the paper pickup assembly. If the jam occurs during a multiple-page document, media might arrive in the fuser, but the

Table 7-6 Error messages and associated jam locations (continued)

Error message	Jam location	Action
		jam is still a result of the media arriving late to the paper leading-edge sensor (PS3) from the specified tray. The printer will not boot up if a 13.01.00 jam occurs.
13.02.00 JAM IN TRAY x	4 or 5; printer	A 13.02.00 jam occurs when the paper leading-edge sensor (PS3) has been triggered, but never clears. The media remains in the registration assembly. After opening and closing the front covers and ETB, the printer can boot up when a 13.02.00 error exists, if the sensor is stuck or media remains in the sensor.
13.09.00 JAM IN TOP COVER AREA	1; printer	A 13.09.00 jam occurs when the media has successfully left the paper pick unit, cleared the paper leading-edge sensor (PS3), and arrived at the fuser, triggering the fuser inlet paper sensor (PS11). The media folds into an accordion jam in the fuser and never triggers the fuser delivery sensor (PS12), causing a 13.09.00 error message. **WARNING!** The fuser is hot, wait 10 minutes for it to cool down.
13.0A.00 JAM IN TOP COVER AREA or 13.20.00 JAM IN TOP COVER AREA	1; printer	A 13.0A.00 jam occurs when the printer is trying to deliver sheets to the output bin for a simplex job or, for a duplex turnaround, when the paper was late leaving or never left the fuser delivery sensor (PS12). The media might have been incorrectly loaded in the paper trays, something in the fuser might be obstructing the media, or the sensor could be stuck or broken. **WARNING!** The fuser is hot, wait 10 minutes for it to cool down.
13.12.00 JAM IN DUPLEX PATH	1, 2, 3; printer	A 13.12.00 jam occurs when the printer is trying to print a duplex print job after the media has entered the fuser and started back down the paper path, but has never arrived at or was late getting to the paper leading-edge sensor (PS3). The media might have been disturbed by an outside source, (for example, someone might have grabbed the media while it was turning around), or something might be in the fuser that is obstructing the media.

Jam recovery

This printer automatically provides jam recovery, a feature that you can use to set whether the printer should attempt to automatically reprint jammed pages. Two options are:

- **AUTO**. The printer will attempt to reprint jammed pages.
- **OFF**. The printer will not attempt to reprint jammed pages.

NOTE During the recovery process, the printer might reprint several pages that were printed correctly before the jam occurred. Be sure to remove any duplicated pages.

To disable paper jam recovery

1. Press ✓ (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models) to open the **MENUS**.
2. Press ▼ to highlight **CONFIGURE DEVICE**.
3. Press ✓ to select **CONFIGURE DEVICE**.
4. Press ▼ to highlight **SYSTEM SETUP**.
5. Press ✓ to select **SYSTEM SETUP**.
6. Press ▼ to highlight **JAM RECOVERY**.
7. Press ✓ to select **JAM RECOVERY**.
8. Press ▼ to highlight **OFF**.
9. Press ✓ to select **OFF**.
10. Press the PAUSE/RESUME (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models) to return to the **READY** state.

To improve print speed and increase memory resources, you might want to disable jam recovery. If jam recovery is disabled, any pages that are involved in a jam will not be reprinted.

Avoiding jams

Table 7-7 Common causes of jams

Cause	Solution
The print media does not meet HP-recommended media specifications.	Use only media that meets HP specifications.
A supply item is installed incorrectly, causing repeated jams.	Verify that all print cartridges, the ETB, and the fuser are correctly installed.
You are reloading media that has already passed through a printer or copier.	Do not use media that has been previously printed on or copied.
An input tray is loaded incorrectly.	Remove any excess media from the input tray. Press the media down in the input tray so that it fits below the tabs and within the media width guides.
The printed pages are skewed.	The input-tray guides are not adjusted correctly. Adjust input tray guides so they hold media firmly in place without bending it. If media heavier than 105 g/m^2 (28 lb) is loaded into tray 2 or tray 3, or tray 3/4, the media might skew.
The print media is binding or sticking together.	Remove the media, flex it, rotate it 180°, or flip it over. Reload the media into the input tray. Do not fan media.
The print media is removed before it settles into the output bin.	Reset the printer. Wait until the page completely settles in the output bin before removing it.
When duplexing, the print media is removed before the second side of the document is printed (HP Color LaserJet 4600 and 4650 models only).	Reset the printer and print the document again. Wait until the page completely settles in the output bin before removing it.
The print media is in poor condition.	Replace the print media.

Table 7-7 Common causes of jams (continued)

Cause	Solution
The internal rollers do not pick up print media from tray 2, tray 3, or tray 3/tray 4 (2 x 500-sheet feeder, HP CLJ 4650 only). **NOTE** The HP Color LaserJet 4610n printer does *not* support tray 3 or tray 3/tray 4.	Remove the top sheet of media. If the media is heavier than 105 g/m^2 (28 lb), it might not be picked from the tray.
The print media has rough or jagged edges.	Replace the media.
The print media is perforated or embossed.	This media does not separate easily. You might need to feed single sheets from tray 1.
One or more printer supply items have reached the end of their useful life.	Check the printer control panel for messages prompting you to replace supplies, or print a supplies status page to verify the remaining life of the supplies.
The print media was not stored correctly.	Replace the print media. Media should be stored in its original packaging in a controlled environment.

Persistent jams

If jams occur repeatedly, use the information in this section to diagnose the root cause of the problem. The tables in this section list possible causes and recommended solutions for jams in each area of the paper path. Items are listed in the order that you should use to investigate. In general, items at the beginning of the list are relatively minor repairs. Items at the end of the list are more complex repairs.

Basic troubleshooting for jams

Use the following basic troubleshooting process for jams:

1. Gather data.
2. Identify the cause of the problem.
3. Fix the problem.

Data collection

To troubleshoot jams, gather the following information:

- The exact jam error code tat appears on the control-panel display
- The location of the leading edge of the media that is in the paper path
- Whether media is in the paper path when the jam occurs or in the input tray
- Whether the jam occurs at power-up or while media is moving
- Whether the media is damaged and, if it is, where the damage occurs on the paper and where in the paper path the sheet stops
- Whether the jam occurs when feeding from one particular tray
- Whether the jam occurs only when using duplex printing (HP CLJ 4600 and 4650 models only)

- Whether a particular type of media is jamming or not jamming
- Whether any of the supplies are non-HP (non-HP supplies are known to cause jams)
- Whether the customer is storing the media correctly, overloading the trays, damaging the edge of the media during loading, or using media that has already been fed through the printer

General paper-path troubleshooting

Use the following suggestions to isolate the cause of the problem. After you have identified the cause, use the tables in this section to find a recommended solution.

NOTE Use the paper-path test in the **Diagnostics** menu to print pages while troubleshooting.

- View or print the event log and determine if a particular jam error occurs more often than others. Try to identify a pattern.
- Use the event log to determine the frequency of a particular jam. If a jam occurs repeatedly at approximately the same page count, consider it a single jam that the customer tried to clear.
- Try printing from all available input trays to identify whether the problem is isolated to one tray.
- Print the job in both simplex and duplex modes to identify whether the problem occurs only in one mode or the other.
- Try printing on media from an unopened ream that has been stored correctly. If the jam does not occur with this media, then the customer's media might be causing the problem.
- If the jam occurs from when the printer is turned on, check the paper path for small, torn pieces of media. Also check for broken sensors or flags, and check for loose or defective connections.
- If the media is torn, folded, or wrinkled (typically along the leading edge), inspect the paper path for items that could be causing the damage.
- If the user is using non-HP supplies, try replacing those supplies with genuine HP supplies to see if the problem goes away.
- If necessary, instruct the user about proper media storage, correct loading technique, and printer operation. Make sure the user knows not to grab paper in the output bin during duplex printing.

Paper-path checklist

- Verify that media is correctly loaded in the input trays and that all length and width guides are set correctly.
- Clean the printer. Toner and paper dust in the paper path can inhibit the free movement of media through the printer and can block the sensors.
- Use the paper-path test in the **Diagnostic** menu to vary the input selections of the printer to determine if the problem is associated with a particular area of the printer.
- Worn rollers or separation pads can cause multifeeds. Check the condition of the pickup rollers and separation pads. Bent separation tabs (on the front corners of the input trays) can cause misfeeds and multifeeds. Replace the tray if necessary.

- Defective paper-tray switches can cause jams by communicating the wrong paper size to the formatter.
- Defective paper sensors along the paper path might falsely signal a jam.
- Scraps of media that remain in the paper path can cause intermittent jams. Always check that the paper path is clear when cleaning the printer and when clearing jams. Also, remove the fuser and carefully check it for debris from jams.

Jams in tray 1

The following table describes the cause of and solution for jams in tray 1.

Table 7-8 Causes for jams in tray 1

Cause	Solution
The pickup roller is dirty, worn, or damaged.	Clean the pickup roller. If it is still dirty after cleaning, or if it is worn or damaged, replace the pickup roller.
The separation pad is defective.	Clean the separation pad. If it is still dirty after cleaning, or if it is worn or damaged, replace the separation pad.
The drive gears are damaged.	Check the drive gears in the paper pickup unit. Replace the pickup drive assembly if the gears are damaged.
The multipurpose tray pickup solenoid is defective.	1 Disconnect the connector J1020 for the multipurpose tray pickup solenoid from the DC controller PCA. 2 Measure the resistance between the cable-side connectors J1020-11 and J1020-10. 3 If the measured resistance is *not* about 160 ohms, replace the multipurpose tray pickup solenoid.
The pickup motor is defective.	Replace the paper pickup drive assembly.
The paper pickup assembly is defective.	Replace the paper pickup assembly.
The DC controller PCA is defective.	Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).

Jams in tray 2

The following table describes the cause of and solutions for jams in tray 2.

Table 7-9 Causes for jams in tray 2

Cause	Solution
The separation tabs in the paper cassette are deformed.	Straighten the tabs on the front corners of the tray, or replace the cassette.
The pickup roller is worn or damaged.	Replace the pickup roller.
The feed roller is dirty, worn, or damaged.	Clean the feed roller. If it is still dirty after cleaning, or if it is worn or damaged, replace the feed roller.

Table 7-9 Causes for jams in tray 2 (continued)

Cause	Solution
The drive gears are damaged.	Check the drive gears in the paper pickup unit. Replace the pickup drive assembly if the gears are damaged.
The cassette pickup solenoid is damaged.	1 Disconnect the connector for the cassette pickup solenoid from the DC controller PCA. 2 Measure the resistance between the cable-side connectors J1020-13 and J1020-12. 3 If the measured resistance is *not* about 160 ohms, replace the cassette pickup solenoid.
The pickup motor is defective.	Replace the paper pickup drive assembly.
The paper pickup assembly is defective.	Replace the paper pickup assembly.
The DC controller PCA is defective.	Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).

Jams in tray 3 or tray 3/tray 4 (2 x 500-sheet paper feeder, HP CLJ 4650 only)

The following table describes the cause of and solutions for jams in tray 3 or 3/4.

NOTE The HP Color LaserJet 4610n does not support tray 3 or tray 3/tray 4. Tray 3/tray 4 is supported only on the HP Color LaserJet 4650 models.

Table 7-10 Causes for jams in tray 3 or tray 3/tray 4 (2 x 500-sheet paper feeder,)

Cause	Solution
The separation tabs in the paper cassette are deformed.	Straighten the tabs on the front corners of the tray, or replace the cassette.
The pickup roller is worn or damaged.	Replace the pickup roller.
The feed roller is dirty, worn, or damaged.	Clean the feed roller. If it is still dirty after cleaning, or if it is worn or damaged, replace the feed roller.
The drive gears are damaged.	Check the drive gears in the paper pickup unit. Replace the pickup drive assembly if the gears are damaged.
The connector to the printer has poor contact.	Reconnect all of the connectors to the printer. Replace any damaged connectors.
The paper feeder pickup solenoid is damaged.	1 Disconnect the connector J4006 for the paper feeder solenoid from the paper feeder PCA. 2 Measure the resistance between the cable-side connectors J4006-2 and J4006-1. 3 If the measured resistance is *not* about 160 ohms, replace the paper feeder pickup solenoid.
The pickup motor is defective.	Replace the paper pickup drive assembly.
The paper feeder PCA is defective.	Replace the paper feeder PCA.

Table 7-10 Causes for jams in tray 3 or tray 3/tray 4 (2 x 500-sheet paper feeder,) (continued)

Cause	Solution
The paper pickup assembly is defective.	Replace the paper pickup assembly.
The DC controller PCA is defective.	Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).

Jams in the paper path

The following table describes the cause of and solution for jams in the paper path.

Table 7-11 Causes for jams in the paper path

Cause	Solution
The registration shutter is defective. (This applies to jams that occur before the registration roller.)	Make sure that the shutter is clean and moves smoothly, and that the spring is in place. If the shutter is damaged, replace the paper pickup assembly.
The drive gears are damaged. (This applies to jams that occur in advance of the registration roller.)	Check the drive gears in the paper pickup unit. Replace the pickup drive assembly if the gears are damaged.
The registration roller and registration sub roller are dirty, worn, or damaged. (This applies to jams that occur in advance of the registration roller.)	Clean the registration roller or registration sub-roller if it is dirty. If it is still dirty after cleaning, or if it is worn or damaged, replace the paper pickup assembly.
The attaching roller is damaged. (This applies to jams in which media is crumpled into an accordion when it enters the ETB.)	Check the attaching roller to see if it is damaged. If it is damaged, replace the ETB. Calibrate the printer after replacing the ETB. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).
The cartridge shutter open/close mechanism is damaged. (This applies to jams in which media is crumpled into an accordion fold somewhere on the ETB belt.)	The shutters in each print cartridge should open as you close the ETB. If a shutter does not open, replace that print cartridge. Also check for a damaged shutter mechanism in the printer.
The cartridge drive motor assembly is damaged.	Inspect the cartridge drive assembly in each print cartridge. If any are damaged, replace the assembly for that print cartridge.
The attaching roller is defective.	Make sure that the attaching roller is clean and the spring is in place. If the roller is damaged, replace the ETB. Calibrate the printer after replacing the ETB. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).
The paper leading edge sensor is defective.	Replace the pickup PCA.
The DC controller PCA is defective.	Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).

Jams in the top cover

The following table describes the causes of and solutions for jams in the top cover.

Table 7-12 Causes for jams in the top cover

Cause	Solution
The fuser paper sensor or sensor lever is defective.	Make sure that the fuser paper sensor lever moves smoothly and is set in place. Replace the lever if it is damaged. Replace the sensor if it is defective.
The fuser sleeve or pressure roller does not rotate smoothly.	If the fuser drive gears are worn or damaged, replace the fuser.
The fuser inlet guide is dirty or is covered with toner.	Clean the fuser inlet guide.
The fuser sleeve or pressure roller is dirty, worn, or damaged.	Clean the fuser sleeve or pressure roller. If it is damaged, replace the fuser.
The fuser delivery sensor or sensor lever is defective.	Make sure that the fuser delivery sensor lever moves smoothly and is set in place. Replace the lever if it is damaged. Replace the sensor if it is defective.
The fuser delivery roller is worn.	Replace the fuser.
The fuser delivery roller drive gears are worn or damaged.	Replace the fuser.
The face-down delivery roller is defective.	Replace the fuser.
DC controller PCA is defective.	Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).

Jams in the duplex path (HP CLJ 4600 and 4650 models only)

The following table describes the causes of and solution for jams in the duplex path.

Table 7-13 Causes for jams in the duplex path

Cause	Solution
The oblique rollers are worn or damaged.	Replace the oblique rollers.
The oblique roller drive gears are worn or damaged.	Replace the ETB unit. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).
The duplex feed guide is damaged.	Replace the ETB unit. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).

Media-transport troubleshooting

If media is feeding incorrectly, use the information in this section to identify and resolve the problem.

Multiple pages are fed

The following table describes the causes of and solutions for multiple pages feeding.

Table 7-14 Causes for multiple pages feeding

Cause	Solution
The separation tabs in the cassette are damaged (tray 2, tray 3, or tray 3/4 [2 x 500 sheet feeder]). **NOTE** The HP Color LaserJet 4610n does not support tray 3 or tray 3/tray 4. Tray 3/tray 4 is supported only on the HP Color LaserJet 4650 models.	Straighten the tabs on the front corners of the tray, or replace the cassette.
The multipurpose tray separation pad is worn.	Replace the separation pad assembly.
The multipurpose tray separation pad has a defective spring.	Make sure that the spring is set in place. If the spring is damaged, replace the separation pad assembly.

Media is wrinkled or folded

To diagnose the cause of wrinkled or folded media, use the **Print/Stop** test in the **Diagnostics** menu. Adjust the stop time to stop the media before it enters the fuser. Open the ETB. If the media is wrinkled at this stage, use Table 7-16 Causes for wrinkled or folded paper (part two: paper-path exit) to diagnose the problem. If the media is *not* wrinkled at this stage, use Table 7-15 Causes for wrinkled or folded media (part one: paper-path entrance) to diagnose the problem.

Table 7-15 Causes for wrinkled or folded media (part one: paper-path entrance)

Cause	Solution
The registration shutter is defective.	Make sure that the registration shutter is clean and moves smoothly. If the registration shutter is worn or damaged, replace the paper pickup assembly.
The feed roller or registration roller is dirty or defective.	Replace the paper pickup assembly.
The paper path has foreign substances or dirt.	Remove any foreign substances or dirt from the paper path. If the feed guide is damaged, replace the paper pickup assembly.
The cartridge shutter open/close mechanism is damaged. (This applies to jams in which paper is crumpled into an accordion fold somewhere on the ETB belt.)	The shutters in each print cartridge should open as you close the ETB. If a shutter does not open, replace that print cartridge. Also check for a damaged shutter mechanism in the printer.

Table 7-16 Causes for wrinkled or folded paper (part two: paper-path exit)

Cause	Solution
The fuser inlet guide is dirty.	Clean the fuser inlet guide.

Table 7-16 Causes for wrinkled or folded paper (part two: paper-path exit) (continued)

Cause	Solution
The fuser pressure roller is dirty or damaged.	Clean the pressure roller. If the pressure roller is damaged, replace the fuser.
The fuser sleeve is dirty or damaged.	Clean the fuser sleeve. If the fuser sleeve is damaged, replace the fuser.
The fuser delivery roller is dirty.	Clean the fuser delivery roller.

Paper is skewed

Table 7-17 Causes for skewed paper

Cause	Solution
The paper dust or dirt has accumulated in the cassette feed roller or registration roller.	Clean the rollers.
The cassette feed roller and registration roller are worn irregularly.	Replace the paper pickup assembly.
The separation tabs in the cassette are damaged (tray 2, tray 3, or tray 3/4 [2 x 500-sheet feeder]). **NOTE** The HP Color LaserJet 4610n does not support tray 3 or tray 3/tray 4. Tray 3/tray 4 is supported only on the HP Color LaserJet 4650 models.	Straighten the tabs on the front corners of the tray, or replace the cassette.
The registration shutter is defective.	Make sure that the registration shutter moves smoothly, its spring is in place, and it is clean. If the registration shutter is damaged, replace the paper pickup assembly.

Image-formation troubleshooting

The image-formation system is the central hub of the printer. During image formation, an image of colored toner is formed and then fused onto the paper. The image-formation system consists of the following physical components:

- Four laser/scanners
- Four print cartridges
- ETB
- Fuser

Before beginning image-formation troubleshooting, check that the media meets the specifications in the *HP LaserJet Printer Family Print Media Guide*.

Online print-quality troubleshooting tools (HP Color LaserJet 4610n and 4650 models)

Go towww.hp.com/go/printquality/clj4600, www.hp.com/go/printquality/clj4610, or www.hp.com/go/printquality/clj4650 to identify and troubleshoot print-quality issues for the HP Color LaserJet 4610n and 4650 printers as well as to show customers how to troubleshoot print-quality issues. This Web site suggests solutions for eight print-quality issues. It includes a tool that uses standard images in order to ensure that the support agent and the customer have a common diagnostic method for isolating the issue.

You can also visit the Web site from www.hp.com by using the following procedure.

1. On the Main www.hp.com page, click **Support & Drivers**.
2. Type CLJ4610 or CLJ4650 in the open text field, and then click the forward arrows.
3. Click the product name in the list that is provided.
4. Click **print quality troubleshooting tool** under **Hot Topics** in the box at the right of the screen.

NOTE The customer can also go to www.hp.com/bizsupport to find the **print quality troubleshooting tool** under **Hot Topics**.

These Web sites provide intuitive, step-by-step directions for producing print-quality troubleshooting pages that can be used to isolate issues and provide possible print-quality solutions.

Print-quality problems associated with media

Some print-quality problems arise from use of inappropriate media.

- Use media that meets HP specifications.
- The surface of the media is too smooth. See Print-media specifications.
- The printer driver is set incorrectly. Change the paper-type setting to **HEAVY** or **GLOSSY**.
- The media that you are using is too heavy for the printer, and the toner is not fusing to the media.

- The transparencies that you are using are not designed for correct toner adhesion. Use only transparencies that are designed for HP Color LaserJet printers.
- The moisture content of the paper is uneven, too high, or too low. Use paper from a different source or from an unopened ream of paper.
- Some areas of the paper reject toner. Use paper from a different source or from an unopened ream of paper.
- The letterhead that you are using is printed on rough paper. Use a smoother, xerographic paper. If this solves your problem, consult with the printer who produces your letterhead to verify that the paper used meets the specifications for this printer.
- The paper is excessively rough. Use a smoother, xerographic paper.

Overhead transparency defects

Overhead transparencies can show any of the image-quality problems that appear on any other type of media, as well as defects that are specific to printing on transparencies. In addition, because transparencies are pliable while in the print path, they are subject to being marked by the media-handling components.

NOTE Allow transparencies to cool for at least 30 seconds before handling them.

- In the printer driver **Paper** tab, select **Transparency** as the media type. Also, make sure that the tray is correctly configured for transparencies.
- Check that the transparencies meet the specifications for this printer. See Print-media specifications. For more information, see the *HP LaserJet Printer Family Print Media Guide.*
- Handle transparencies by the edges. Skin oil on the surface of transparencies can cause spots and smudges.
- Small, random dark areas on the trailing edge of solid-fill pages can be caused by transparencies sticking together in the output bin. Try printing the job in smaller batches.
- The printed colors are unacceptable. Select different colors in the software program or printer driver.
- If you are using a reflective overhead projector, use a standard overhead projector instead.

Print-quality problems that are associated with the environment

Print-quality problems can occur if the printer is operating in excessively humid or dry conditions. Verify that the printing environment is within specifications. See Environmental specifications.

Print-quality problems that are associated with jams

Take the following actions to prevent problems that are associated with printer jams.

- To avoid problems after a jam, make sure that all media is cleared from the paper path.
- If the printer recently jammed, print two to three pages to clean the printer.
- If the media does not pass through the fuser, image defects might appear on subsequent documents. Print two to three pages to clean the printer. If the problem persists, see the next section to print a troubleshooting page.

Print-quality troubleshooting pages

Use the built-in print quality troubleshooting pages to help diagnose and solve print-quality problems.

1. Press ✓ (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models) to open the **MENUS**.
2. Press ▼ to highlight **DIAGNOSTICS**.
3. Press ✓ to select **DIAGNOSTICS**.
4. Press ▼ to highlight **PQ TROUBLESHOOTING**.
5. Press ✓ to print the pages.

The printer returns to the **Ready** state after you print the print-quality troubleshooting pages.

Understanding color variations

The printed output might not match the computer screen, and the colors printed on successive pages might not match. While color variations are inherent in this printing method, they can indicate changes in the printing environment, print media, or printer components.

Common causes of color variation

The following list outlines the major causes of color variations between computers, programs, and output devices.

- Halftone patterns that are produced on monitors and the types of patterns that are used in the print jobs are different and might cause variations in the printed output.
- The printed output differs from the image on the monitor because the monitor and the print media have different reference values of black and white. The monitor screen has charcoal gray for the black level, and the white on the monitor screen is actually blue. Black on the print media is limited only by the fill capability of the printer, and most good-quality paper has a very high white level. In addition, phosphor (used in color monitors) and toner have entirely different spectra characteristics and different color-rendering capabilities. Differences between output are common. Blues generally match better than reds.
- The color of the ambient light changes the perception of color. Fluorescent light lacks many colors that are present in incandescent light, and the color range of natural light is broader than any artificial light. When comparing color, choose a standard light source for reference and understand that the perceived color will change as the light changes.

- Long-term color variations occur as paper ages. Use high-quality paper and protect the paper from sunlight to help minimize discoloration.
- Environmental changes can cause color variation. The development process places a high potential across an air gap to attract toner to the imaging drum. Changes in relative humidity vary the point at which the toner travels to the imaging drum.
- All consumable components have a finite life span. As these components reach the end of their useful life, their ability to produce consistent print quality diminishes.
- Paper roughness can cause colors to look different. Use standard paper.

Color selection process

The user selects the color in the program, but the operating system might convert or modify some characteristics of the color before sending the information to the printer driver. The printer driver might also modify color characteristics depending upon the selected output mode.

Any color characteristics that the printer driver or programs do not address are set to the printer default. The default color might not match the color the user selected.

Matching colors

PANTONE®* color matching

PANTONE®* has multiple color-matching systems. The PANTONE®* Matching System is very a popular system that uses solid inks to generate a wide range of color hues and tints. See www.hp.com for details about how to use the PANTONE®* Matching System with this printer.

Swatch book color matching

The process for matching printer output to preprinted swatch books and standard color references is complex. In general, you can obtain a reasonably good match to a swatch book if the inks that are used to create the swatch book are cyan, magenta, yellow, and black. These are usually referred to as process color swatch books.

Some swatch books are created from spot colors. Spot colors are specially created colorants. Many of these spot colors are outside of the gamut of the printer. Most spot color swatch books have companion process swatch books that provide CMYK approximations to the spot color.

Most process swatch books have a note about what process standards were used to print the swatch book. In most cases they will be SWOP, EURO, or DIC. To get optimal color matching to the process swatch book, select the corresponding ink emulation from the printer menu. If you cannot identify the process standard, use SWOP ink emulation.

Using color

HP ImageREt 2400 (HP Color LaserJet 4600 models)

HP ImageREt 2400 is a technology that provides the best color-print quality without having to change driver settings or make trade-offs among print quality, performance, and memory.

HP ImageREt 2400 has been improved for this printer. The improvements offer trapping technologies, even greater control over dot placement, and more precise control of toner quality in a dot. These new technologies, coupled with HP's multilevel printing process, result in a 600-by-600 dpi printer that provides 2400-dpi color laser-class quality with millions of smooth colors.

HP ImageREt 3600 (HP Color LaserJet 4610n and 4650 models)

HP ImageREt 3600 print technology is a system that HP developed to deliver superior print quality and technological innovation. The HP ImageREt system incorporates technology that optimizes each element of the print system.

Several categories of HP ImageREt have been developed that meet a variety of user needs. The system is comprised of key laser technologies for color printing, including image enhancements, smart supplies, and high-resolution imaging. The ImageREt core technologies are refined in higher level systems for more advanced system users, and additional technologies are integrated.

The HP ImageREt 3600 is a complete HP proprietary printing solution, developed and implemented for the first time in the HP Color LaserJet 4650 printer. HP now offers superior image enhancements for general office and marketing documents. HP ImageREt 3600 performs well in different environmental conditions and with a variety of media, and the image mode is optimized for printing on HP High Gloss Laser Paper.

Paper selection

For the best color and image quality, select the appropriate media type from the printer menu or from the front panel.

sRGB

Standard red-green-blue (sRGB) is a world-wide color standard originally developed by HP and Microsoft as a common color language for monitors, input devices (scanners, digital cameras), and output devices (printers, plotters). It is the default color space used for HP products, Microsoft operating systems, the World Wide Web, and most office software that is sold today. sRGB is representative of the typical Windows computer monitor today and the convergence standard for high-definition television.

NOTE Factors such as the type of monitor you use and the room's lighting can affect the appearance of colors on your screen. For more information, see Matching colors.

The latest versions of Adobe® PhotoShop®, CorelDRAW®, Microsoft Office, and many other programs use sRGB to communicate color. Most importantly, as the default color space in Microsoft operating systems, sRGB has gained broad adoption as a means to exchange color information between programs and devices using a common definition that assures typical users will experience greatly improved color matching. sRGB improves your ability to match colors among the printer, the computer monitor and other input devices (scanner, digital camera) automatically, without the need to become a color expert.

Color options

Color options enable optimal color output automatically for diverse types of documents.

Color options use object tagging, which allows optimal color and halftone settings to be used for different objects (text, graphics, and photos) on a page. The printer driver determines which objects are used on a page and uses halftone and color settings that provide the best print quality for each object. Object tagging, combined with optimized default settings, produces great color out of the box.

In the Windows environment, the **Automatic** and **Manual** color options are on the **Color** tab in the printer driver.

Setting color options to **Automatic** will typically produce the best possible print quality for color documents. However, situations might occur when you want to print a color document in grayscale (black and white) or want to change one of the printer's color options.

- Using Windows, print in grayscale or change the color options by using settings on the **Color** tab in the printer driver.
- Using a Macintosh computer, print in grayscale or change the color options by using the **Color Matching** pop-up menu in the **Print** dialog box.

Print in Grayscale

Selecting the **Print in Grayscale** option from the printer driver prints a document by using black toner. This option is useful for previewing preliminary copies of slides and hardcopy output, or for printing color documents that will be photocopied or faxed.

Automatic or manual color adjustment

The **Automatic** color adjustment option optimizes the neutral gray color treatment, halftones, and edge enhancements used for each element in a document. For more information, see your printer driver online Help.

NOTE Automatic is the default setting and is recommended for printing all color documents.

Use the **Manual** color adjustment option to adjust the neutral gray color treatment, halftones, and edge enhancements for text, graphics and photographs. To gain access the Manual color options, on the **Color** tab, select **Manual**, and then select **Settings**.

Manual color options

Use manual color adjustment to adjust the Color (or Color Map) and Halftone options individually for text, graphics, and photographs.

NOTE Some programs convert text or graphics to raster images. In these cases, the **Photographs** settings also controls text and graphics.

Halftone options

Halftone options affect the resolution and clarity of your color output. You can select halftone settings for text, graphics, and photographs independently. The two halftone options are **Smooth** and **Detail**.

- The **Smooth** option provides better results for large, solid-filled print areas. It also enhances photographs by smoothing out fine color gradations. Choose this option when uniform and smooth area fills are top priority.
- The **Detail** option is useful for text and graphics that require sharp distinctions among lines or colors, or images that contain a pattern or a high level of detail. Choose this option when sharp edges and details are top priority.

Neutral Grays

The **Neutral Grays** setting determines the method used for creating gray colors used in text, graphics, and photographs.

Two values are available for the **Neutral Grays** setting:

- **Black Only** generates neutral colors (grays and black) using only black toner. This guarantees neutrals colors without a color cast.
- **4-Color** generates neutral colors (grays and black) by combining all four toner colors. This method produces smoother gradients and transitions to non-neutral colors, and it produces the darkest black.

Edge Control

The **Edge Control** setting determines how edges are rendered. Edge control has two components: adaptive halftoning and trapping. Adaptive halftoning increases edge sharpness. Trapping reduces the effect of incorrect color plane registration by overlapping the edges of adjacent objects slightly.

Four levels of edge control are available:

- **Maximum** is the most aggressive trapping setting. Adaptive halftoning is on for this setting.
- **Normal** is the default trapping setting. Trapping is at a medium level and adaptive halftoning is on.
- **Light** sets trapping at a minimal level, and adaptive halftoning is on.
- **Off** turns off both trapping and adaptive halftoning.

RGB Color

Two values are available for the **RGB Color** setting:

- **Default** instructs the printer to interpret RGB color as sRGB. sRGB is the accepted standard of Microsoft and the World Wide Web Organization (www).
- **Vivid** instructs the printer to increase the color saturation in the midtones. Less colorful objects are rendered more colorfully. This value is recommended for the printing business graphics
- **Device** instructs the printer to print RGB data in raw device mode. To render photographs properly with this selection, you must manage image color in the program or operating system.

Adjusting color balance

This printer features automatic color calibration to provide high-quality color output. In situations that require critical color control, you can manually adjust the density balance of the four toner colors. The available range for each color is from -5 to +5. The default value is 0.

CAUTION This procedure should only be performed by the network administrator. Performing this procedure changes the color balance of the printer by altering halftones, and affects all print jobs.

To adjust color density

1. Press (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models) to open the **MENUS**.
2. Press to highlight **CONFIGURE DEVICE** menu.
3. Press to select **CONFIGURE DEVICE** menu.
4. Press to highlight **PRINT QUALITY**.
5. Press to select **PRINT QUALITY**.
6. Press or to highlight **ADJUST COLOR**.
7. Press to select **ADJUST COLOR**.
8. Press or to highlight the desired color.
9. Press to select the desired color.
10. Press or to highlight the correct density setting.
11. Press to select the density setting.
12. Press to set the density for the next color.
13. After setting the density for each color, press PAUSE/RESUME (HP Color LasrJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models).

Image defects troubleshooting

If specific defects occur repeatedly, print a Print Quality Troubleshooting page and follow the instructions on the page. If you are unable to resolve the problem, use the information in this section to identify the root cause of the problem.

Image defects fall into the categories that are listed in Table 7-18 Image defects. Possible causes and recommended solutions for each of these categories are listed in the tables that follow. In general, the items are listed in order from minor repairs to major repairs. Check the items in the order in which they appear.

Table 7-18 Image defects

Image defect	Description	More information
Light image	A very light image is printed.	See Light image.
Light color	One color is light in an image.	See Light color.
Dark image	A very dark image is printed.	See Dark image.
Dark color	One color is dark in an image.	See Dark color.
Completely blank	No image is printed.	See Completely blank image.
All black/solid color	An all black or solid colored image is printed.	See All black or solid color.
Dots in vertical lines	Vertical lines of white dots appear in the image.	See Dots in vertical lines.
Dirt on back of paper	The back (non-printed) side of the paper is dirty.	See Dirt on the back of the paper.
Dirt on front of paper	The front (printed) sided of the paper is dirty.	See Dirt on the front of the paper.
Vertical lines	Vertical lines are printed.	See Vertical lines.
White vertical lines	White vertical lines appear in the image.	See White vertical lines.
Horizontal lines	Horizontal lines are printed.	See Horizontal lines.
White horizontal lines	White horizontal lines appear in the image.	See White horizontal lines.
Missing color	One of the four toner colors is not printing.	See Missing color.
Blank spots	The image has blank spots.	See Blank spots.
Poor fusing	Toner is loose on the printed image.	See Poor fusing.
Distortion or blurring	The image appears distorted, or colors seem out of alignment.	See Distortion or blurring.
Smearing	The image is smeared or dirty.	See Smearing.
Misplaced image	The image is placed incorrectly on the page.	See Misplaced image.

Light image

This table contains information about the causes of and solutions for light images.

Table 7-19 Causes for light images

Cause	Solution
The image density is not adjusted correctly.	Increase the density for each color.
A poor contact in the attaching bias contacts between the ETB and the high-voltage PCA.	Clean the contacts. Replace them if they are still dirty or are damaged.
The attaching roller is worn or damaged.	Replace the ETB. Calibrate the printer after replacing the ETB. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).
The high-voltage PCA is defective.	Replace the high-voltage PCA.
The DC controller PCA is defective.	Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).

Light color

This table contains information about the causes of and solutions for light color.

Table 7-20 Causes for light color

Cause	Solution
A poor contact exists in the transfer bias contacts between the ETB and the printer.	Clean the contacts for the affected color. If the contacts are still dirty after cleaning or if they are damaged, replace the contacts or the ETB. Calibrate the printer after replacing the ETB. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).
The transfer charging roller is worn or damaged.	Replace the ETB. Calibrate the printer after replacing the ETB. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).
The photosensitive drum is worn.	Replace the print cartridge for the affected color.
The high-voltage PCA is defective.	Replace the high-voltage PCA.
The laser/scanner unit is defective.	Replace the laser/scanner for the affected color. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).
The DC controller PCA is defective.	Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).

Dark image

This table contains information about the causes of and solutions for dark images.

Table 7-21 Causes for dark images

Cause	Solution
The image density is not adjusted correctly.	Decrease the density for each color.
The color-registration detection unit is dirty.	Clean the lens on the color-registration detection unit.
The color-registration detection unit is defective.	Replace the color-registration detection unit.
The DC controller PCA is defective.	Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).

Dark color

This table contains information about the causes of and solutions for dark color.

Table 7-22 Causes for dark colors

Cause	Solution
A poor contact exists in the drum ground, primary charging bias, and developing bias contacts of the high-voltage PCA and the print cartridge.	Clean the contacts on the cartridge for the affected color. If they are still dirty after cleaning, or if they are damaged, replace the cartridge.
The high-voltage PCA is defective.	Replace the high-voltage PCA.
The DC controller PCA is defective.	Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).

Completely blank image

This table contains information about the causes of and solutions for completely blank pages.

Table 7-23 Causes for a completely blank image

Cause	Solution
The high-voltage PCA is defective.	Replace the high-voltage PCA.
The DC controller PCA is defective.	Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).

All black or solid color

This table contains information about the causes of and solutions for all black or solid color.

Table 7-24 Causes for an all black or solid colored image

Cause	Solution
A poor contact exists in the drum ground, primary charging bias, and developing bias contacts of the high-voltage PCA and the print cartridge.	Clean the contacts on the cartridge for the affected color. If they are still dirty after cleaning, or if they are damaged, replace the cartridge.
The primary charging roller is defective.	Replace the print cartridge for the affected color.
The high-voltage PCA is defective.	Replace the high-voltage PCA.
The DC controller PCA is defective.	Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).

Dots in vertical lines

This table contains information about the causes of and solutions for dots in vertical lines.

Table 7-25 Causes for vertical lines of white dots

Cause	Solution
The transfer charging roller is worn or damaged.	Replace the ETB. Calibrate the printer after replacing the ETB. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).
The high-voltage PCA is defective.	Replace the high-voltage PCA.
The DC controller PCA is defective.	Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).

Dirt on the back of the paper

This table contains information about the causes of and solutions for dirt on the back of the paper.

Table 7-26 Causes for dirt on the back of the paper

Cause	Solution
One or more of the rollers are dirty.	See Repetitive defects troubleshooting for information about identifying the roller that might be dirty. Clean the indicated roller. If the roller is still dirty after cleaning, replace the appropriate roller, cartridge, or assembly.
The pickup roller is dirty.	Clean the roller. If the roller is still dirty after cleaning, replace the pickup roller assembly.
A poor contact exists in the attaching bias contacts between the ETB and the high-voltage PCA.	Clean the contacts. Replace them if they are still dirty or are damaged.
The high-voltage PCA is defective.	Replace the high-voltage PCA.
The DC controller PCA is defective.	Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color

Table 7-26 Causes for dirt on the back of the paper (continued)

Cause	Solution
	LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).

Dirt on the front of the paper

This table contains information about the causes of and solutions for dirt on the front of the paper.

Table 7-27 Causes for dirt on the front of the paper

Cause	Solution
One or more of the rollers are dirty.	See Repetitive defects troubleshooting for information about identifying the roller that might be dirty. Clean the indicated roller. If the roller is still dirty after cleaning, replace the appropriate roller, cartridge, or assembly.
The pickup roller is dirty.	Clean the roller. If is still dirty after cleaning, replace the pickup roller assembly.
A poor contact exists in the attaching bias contacts between the ETB and the high-voltage PCA.	Clean the contacts. Replace them if they are still dirty or are damaged.
The high-voltage PCA is defective.	Replace the high-voltage PCA.
The DC controller PCA is defective.	Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).

Vertical lines

This table contains information about the causes of and solutions for vertical lines.

Table 7-28 Causes for vertical lines

Cause	Solution
The photosensitive drum has grooves around the circumference.	Replace the cartridge that indicates the color of the vertical lines.
The fuser sleeve has grooves around the circumference.	Replace the fuser.

White vertical lines

This table contains information about the causes of and solutions for white vertical lines.

Table 7-29 Causes for white vertical lines

Cause	Solution
The developing cylinder has grooves around the circumference.	Replace the print cartridge for the color in which the white lines appear.
The photosensitive drum has grooves around the circumference.	Replace the print cartridge for the color in which the white lines appear.

Table 7-29 Causes for white vertical lines (continued)

Cause	Solution
The laser is blocked by a foreign substance.	Inspect the laser source for the affected color, and remove any debris that might be blocking it.
The mirror in the laser/scanner unit is dirty.	Replace the laser/scanner for the color in which the white lines appear. Calibrate the printer after replacing the laser/scanner. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).
The fuser sleeve is scarred vertically. (All colors are affected.)	Replace the fuser.

Horizontal lines

This table contains information about the causes of and solutions for horizontal lines.

Table 7-30 Causes for horizontal lines

Cause	Solution
The photosensitive drum has scars that run from end to end.	Replace the print cartridge for the affected color.
The fuser sleeve has scars that run from end to end.	Replace the fuser.

White horizontal lines

This table contains information about the causes of and solutions for white horizontal lines.

Table 7-31 Causes for white horizontal lines

Cause	Solution
The photosensitive drum has scars that run from end to end.	Replace the print cartridge for the affected color.
The ETB belt has horizontal scars.	Replace the ETB. Calibrate the printer after replacing the ETB. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).

Missing color

This table contains information about the causes of and solutions for missing color.

Table 7-32 Causes for a missing color

Cause	Solution
A poor contact exists in the developing bias contacts of the high-voltage PCA and the print cartridge.	Clean the contacts. If they are still dirty after cleaning, or if they are damaged, replace the print cartridge or the high-voltage contacts. Replace the high-voltage PCA.
The primary charging roller is defective.	Replace the print cartridge for the missing color.
The laser/scanner unit is defective.	Replace the laser/scanner for the missing color. Calibrate the printer after replacing the laser/scanner. See Calibrate

Table 7-32 Causes for a missing color (continued)

Cause	Solution
	Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).
The high-voltage PCA is defective.	Replace the high-voltage PCA.
The DC controller PCA is defective.	Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).

Blank spots

This table contains information about the causes of and solutions for blank spots.

Table 7-33 Causes for blank spots

Cause	Solution
The high-voltage PCA is defective.	Replace the high-voltage PCA.
The DC controller PCA is defective.	Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).

Poor fusing

This table contains information about the causes of and solutions for poor fusing.

Table 7-34 Causes for poor fusing

Cause	Solution
The media is not within specifications. For example, media that is too thick causes poor fusing.	Use media that meets specifications. See chapter 1.
The fuser is not within nip-width specifications.	Replace the fuser.
The fuser sleeve is scarred or damaged.	Replace the fuser.
The pressure roller is scarred or damaged.	Replace the fuser.
The thermistor has deteriorated.	Replace the fuser.
The DC controller PCA is defective.	Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).

Distortion or blurring

This table contains information about the causes of and solutions for distortion or blurring.

Table 7-35 Causes for distortion or blurring

Cause	Solution
The color-plane registration is out of specification.	Calibrate the printer from the **Print Quality** menu. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).
The ETB is defective.	If the ETB belt does not rotate smoothly, replace the ETB. Calibrate the printer after replacing the ETB. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).
The ETB motor drive gear is worn or damaged.	Replace the ETB motor.
The drum motor drive gear is worn or damaged.	Replace the drum motor for the affected color.
The color-registration detection unit is defective.	Replace the color registration detection unit.
The laser/scanner unit is defective.	Replace the laser/scanner for the affected color. Calibrate the printer after replacing the laser/scanner. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).
The DC controller PCA is defective.	Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).

Smearing

This table contains information about the causes of and solutions for smearing.

Table 7-36 Causes for smearing

Cause	Solution
A poor contact exists in the printer ground and cartridge ground contacts.	Clean each print-cartridge ground contact and the printer ground contact. If they are still dirty after cleaning, or if they are damaged, replace the cartridge, or replace the printer ground contact.
The fuser inlet guide is dirty or contains debris.	Clean the fuser inlet guide.
The cartridge shutters are not opening.	Make sure the cartridge shutter bar is operating correctly.

Misplaced image

This table contains information about the causes of and solutions for misplaced images.

Table 7-37 Causes for misplaced image

Cause	Solution
The media is skewed.	See Paper is skewed to resolve the skew.

Table 7-37 Causes for misplaced image (continued)

Cause	Solution
The oblique rollers are worn (this issue applies to duplex printing only; HP CLJ 4600 and 4650 models only).	Replace the oblique rollers.
The DC controller PCA is defective.	Replace the DC controller PCA. Calibrate the printer after replacing the DC controller. See Calibrate Now (HP Color LaserJet 4600 models) or Full Calibrate Now (HP Color LaserJet 4610n and 4650 models).

Repetitive defects troubleshooting

Defects on printer rollers can cause image defects to appear at regular intervals on the page. Use the repetitive defects ruler on the next page (Figure 7-3 Repetitive defects ruler (1 of 2)) to measure the distance between defects that recur on a page. Use the Table 7-38 Repetitive defect spacing table to determine which roller is causing the defect. To resolve the problem, try cleaning the roller first. If the roller is still dirty after cleaning or if it is damaged, replace the indicated part.

CAUTION Do not use solvents or oils to clean rollers. Instead, rub the roller with lint-free paper. If dirt is difficult to remove, rub the roller with lint-free paper that has been dampened with rubbing alcohol.

NOTE The letter codes before certain roller names in Table 7-38 Repetitive defect spacing correspond to the letters at the top of the repetitive defects ruler in Figure 7-3 Repetitive defects ruler (1 of 2). Not all rollers are shown in the ruler.

Defects on the cassette or the multipurpose-tray pickup roller cause defects only on the leading edge of the image.

Table 7-38 Repetitive defect spacing

Roller	Distance	Type of defect	Replacement part
A Toner charging roller	14 mm		Print cartridge
B Developing cylinder	33 mm	Defect on front of paper	Print cartridge
C Primary charging roller	38 mm	Blank spots	Print cartridge
D Toner feed roller	39 mm		Print cartridge
E Media attaching roller	38 mm	Defect on front of paper	ETB
F Fuser pressure roller	63 mm	Poor fusing	Fuser
G Photosensitive drum or transfer rollers (center-to-center distance)	75 mm		Any print cartridges that have a damaged photosensitive drum or the ETB
H Photosensitive drum	94 mm	Defect on front of paper Blank spots	Print cartridge
J Fuser sleeve	107 mm	Poor fusing	Fuser
Cassette feed roller	54 mm	Defect on front of paper	Cassette
Cassette feed sub roller	44 mm	Defect on back of paper	Cassette

Table 7-38 Repetitive defect spacing (continued)

Roller	Distance	Type of defect	Replacement part
Registration roller	54 mm	Defect on back of paper	Paper pickup assembly
Registration sub roller	57 mm	Defect on front of paper	Paper pickup assembly
Fuser delivery roller	38 mm	Defect on back of paper	Fuser
Face-down delivery roller	49 mm	Defect on back of paper	Fuser
Cassette pickup roller	See the note above this table	Defect on front of paper	Paper pickup rollers
Multipurpose-tray pickup roller	See the note above this table	Defect on back of paper	Multipurpose-tray pickup roller assembly

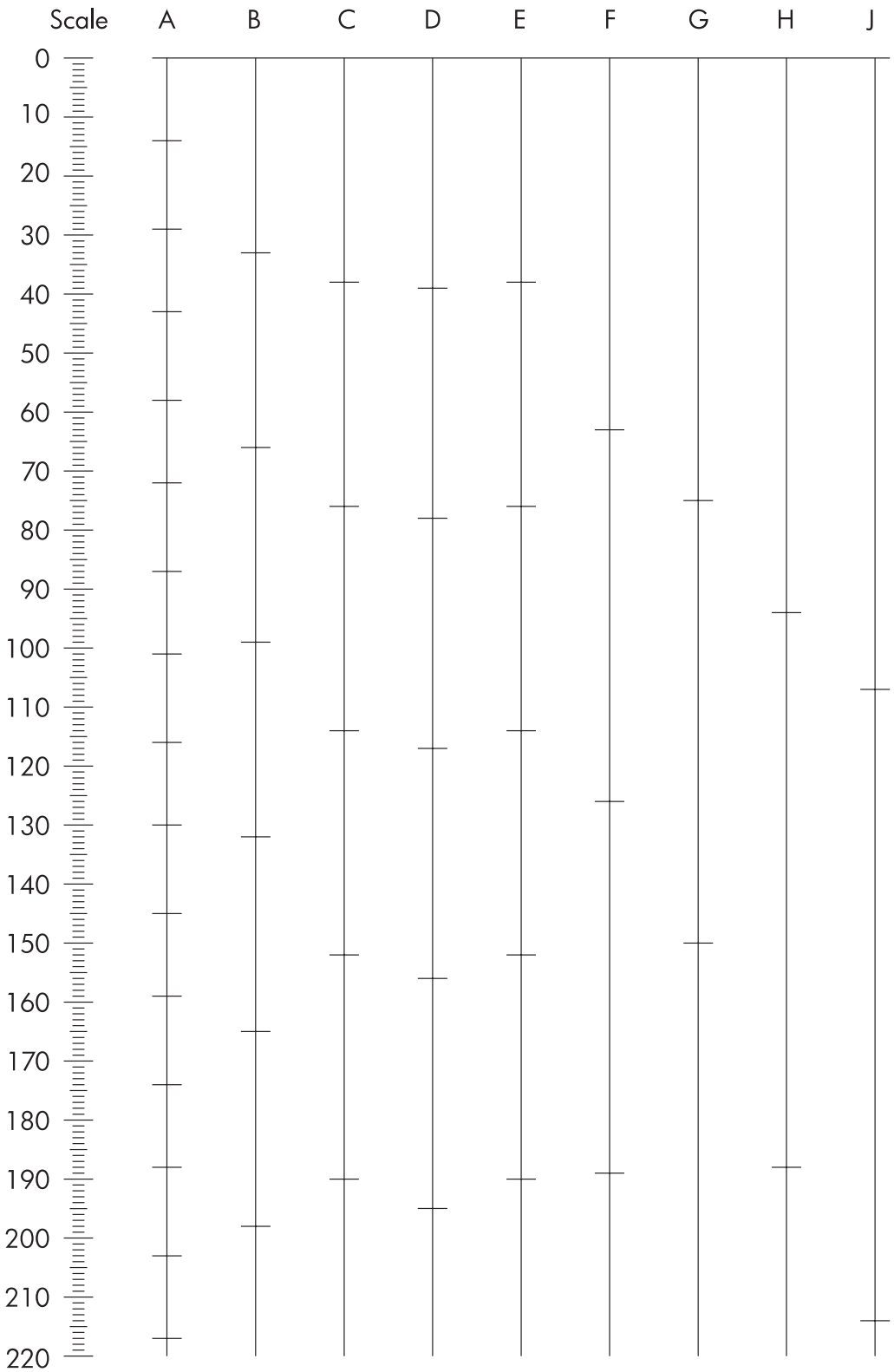


Figure 7-3 Repetitive defects ruler (1 of 2)

NOTE Figure 7-3 Repetitive defects ruler (1 of 2) might not print to scale and should only be used as a reference tool.

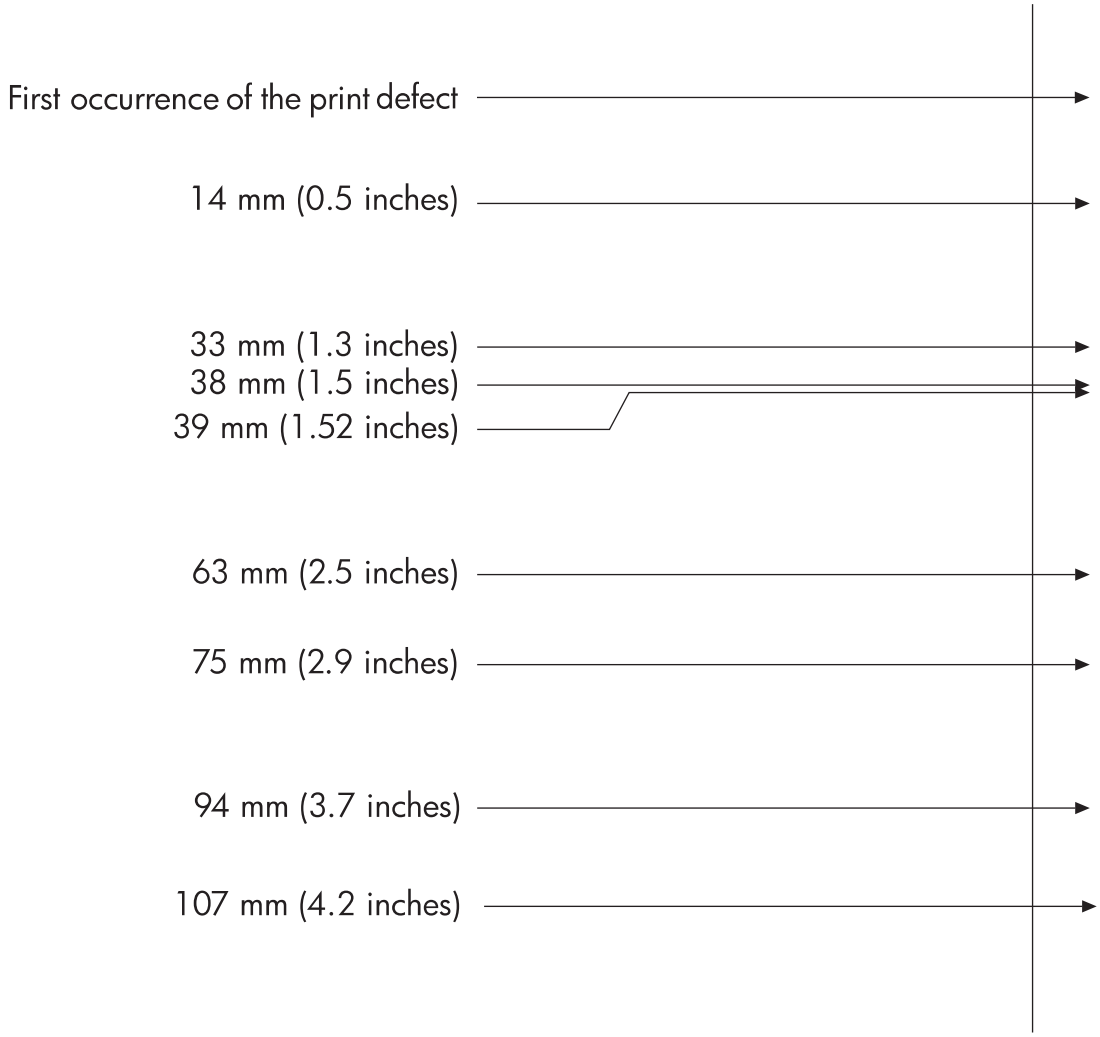

First occurrence of the print defect
14 mm (0.5 inches)
33 mm (1.3 inches)
38 mm (1.5 inches)
39 mm (1.52 inches)
63 mm (2.5 inches)
75 mm (2.9 inches)
94 mm (3.7 inches)
107 mm (4.2 inches)

Figure 7-4 Repetitive defects ruler (2 of 2)

Interface troubleshooting

Communications checks

NOTE Communication problems are normally the customer's responsibility. Time spent attempting to resolve these problems might not be covered by the Hewlett-Packard Company warranty. Refer the customer to the network administrator for assistance in troubleshooting network problems.

If the printer is not connected to an MS-DOS-based host, proceed to the Table 7-39 Communications check table.

Table 7-39 Communications check

Check	Action
Is your computer configured to the parameters that are described in the configuration instructions?	These parameters are required in order to communicate with the printer. Verify that the configuration of the computer's communications port matches these parameters. **NOTE** If these parameters are not set correctly, an error message might appear on the control-panel display.

EIO troubleshooting (HP CLJ 4600 and 4650 models only)

If the printer contains an optional HP Jetdirect print server, and you cannot communicate with the printer over the network, verify the operation of the print server. Print a configuration page. If the Jetdirect card does not appear under "Installed personalities and options" on the configuration page, see the troubleshooting section of the *HP Jetdirect Print Server Software Installation Guide*.

If the host system and printer are still not communicating, replace the formatter PCA and the EIO card and reconfigure the printer. If the problem persists, a protocol analyzer might be needed in order to find the source of the problem.

CAUTION HP LaserJet printers are not designed to work with mechanical switch-box products that do not offer the correct surge protection. These devices generate high transient voltages that cause permanent damage to the formatter PCA. This circumstance is not covered by the Hewlett-Packard Company warranty.

AUTOEXEC.BAT standard configurations

Parallel MS-DOS commands

Ensure that the AUTOEXEC.BAT file contains the following statements for parallel interface communications:

MODE LPT1: ,,P

For MS-DOS version 4.0 and above:

MODE LPT1: ,,B

NOTE This example assumes that you are using parallel printer port LPT1. If you are using LPT2 or LPT3, replace LPT1 in the example with the appropriate printer port.

Printer Job Language (PJL) commands

See the *HP Printer Job Language Technical Reference Manual* for a complete description of PJL commands. This manual is available with the HP PCL/PJL reference set on CD-ROM (part number 5021-0337).

@PJL [Enter]

This command enables the specified printer language. If the printer does not receive this command, it enables the default language. This ensures the correct operation for programs that do not support PJL. The following is the command syntax:

@PJL [Enter] LANGUAGE = {PCL/PostScript} [<CR>] <LF>

UEL

This command (also referred to as the universal exit language command) terminates the current printer language and returns control to PJL. It performs the following actions:

- Prints all data that was received before this command.
- Performs a reset: <esc>E in PCL, <cntrl>D in PostScript.
- Turns control over to PJL.

This command is also a valid HP-GL/2 terminator.

The UEL command must be immediately followed by the "@PJL" command prefix. Characters or control codes other than @PJL (such as <CR> or <LF>) enable the default language and process the print job in that language. All jobs must begin and end with the UEL command. In addition to starting PJL, the UEL command creates the same effect as the <esc>E command. However, the <esc>E command should always be included to ensure backward compatibility.

@PJL COMMENT

This command designates the current line as a comment, which is ignored. The following is the command syntax:

@PJL COMMENT <words> [<CR>] <LF>

@PJL INFO CONFIG

This command solicits a response to describe the installed options and allows the printer to configure the installed options automatically to meet the program requirements.

@PJL INFO ID

This command identifies the printer type to the host for reference when selecting printer drivers for automatic installation. The following is the command syntax:

@PJL INFO ID <CR> <LF>

@PJL INFO USTATUS

This command queries the state of unsolicited JOB status. PAGE and TIMED status are not supported. The following is the command syntax:

@PJL INFO USTATUS <CR> <LF>

@PJL INFO PAGECOUNT

This command returns the number of pages that have been printed by the engine.

@PJL JOB

This command informs the printer of the start of a PJL job and synchronizes the job-status information. The printer counts print jobs, including nested jobs, incrementing the job counter for the @PJL JOB command and decrementing it for @PJL EOJ.

The printer accepts the NAME= parameter and returns the name string in the unsolicited JOB start status message (if the unsolicited job status is enabled). The printer transmits the unsolicited JOB status message to every I/O channel that has enabled this function. The following is the message format:

@PJL USTATUS JOB <CR><LF>START<CR><LF>[NAME=<job name><CR><LF>]<FF>

The printer resets the nested job counter whenever it switches the source to a different I/O channel. This prevents a corrupt job on one channel from disrupting the activities on another channel.

@PJL EOJ

This command identifies the end of a print job and is a hint for the I/O switching algorithm. The printer counts nested jobs and recognizes job boundaries when the counter decrements to zero. The printer ignores isolated EOJ commands. Each EOJ must be preceded by a JOB command.

@PJL ECHO

This printer supports the ECHO command, which transmits its parameters over the I/O channel to the host that issued the command.

@PJL USTATUS JOB=ON/OFF

This command enables or disables the JOB status for the I/O channel that delivers the command.

@PJL USTATUSOFF

This command disables the unsolicited JOB status for the I/O channel that delivered the command. For this printer, it duplicates the function of @PJL USTATUS JOB=OFF, AND @PJL USTATUS DEVICE=OFF.

NOTE All commands that this printer's PJL command set does not support are returned with the message @PJL xxxx<CR><LF>?<CR><LF>.

Control-panel troubleshooting

When you press ✓ (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models) to open the menus, the high-level menus appear in the following order:

- **RETRIEVE JOB** (this menu appears only if a hard disk is installed)
- **INFORMATION**
- **PAPER HANDLING**
- **CONFIGURE DEVICE**
- **DIAGNOSTICS**
- **SERVICE**

A menu map shows how individual items are configured within each of these menus. Figure 7-5 HP Color LaserJet 4600 models menu map shows a sample of one page of the menu map. The menu map prints on six pages. The final page gives instructions about how to use the control-panel buttons.

Printing a menu map

1. Press ✓ (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models) to open the **MENUS**.
2. Press ▼ to highlight **INFORMATION**.
3. Press ✓ to select **INFORMATION**.
4. Press ▼ to highlight **PRINT MENU MAP**.
5. Press ✓ to select **PRINT MENU MAP**.

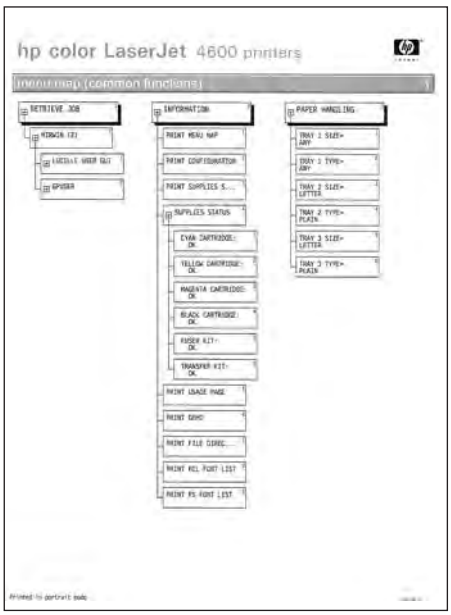


Figure 7-5 HP Color LaserJet 4600 models menu map

Figure 7-6 HP Color LaserJet 4610n/4650 models menu map

Information menu

Use the **Information** menu to gain access to and print specific printer information.

Table 7-40 Information menu

Menu item	Description
PRINT MENU MAP	Prints the control-panel menu map, which shows the layout of and current settings for the control-panel menu items.
PRINT CONFIGURATION	Prints the printer configuration page. The configuration page shows the current printer configuration. If an HP Jetdirect print server is installed, an HP Jetdirect configuration page also prints.
PRINT SUPPLIES STATUS	Prints the estimated remaining life for the supplies; reports statistics for the total number of pages and jobs processed, print cartridge manufacture date, serial number, page counts, and maintenance information.
SUPPLIES STATUS	Shows the supplies status in a searchable list.
PRINT USAGE	Prints a count of all media sizes that have passed through the printer; lists whether they were simplex, duplex, monochrome, or color; and reports the page count.
PRINT DEMO	Prints a demonstration page.
PRINT RGB SAMPLES (HP Color LaserJet 4610n and 4650 models)	Prints color samples for different RGB values. The samples act as a guide for color matching on the HP Color LaserJet 4650 models.
PRINT CMYK SAMPLES (HP Color LaserJet 4610n and 4650 models)	Prints color samples for different CMYK values. The samples act as a guide for color matching on the HP Color LaserJet 4650 models.
PRINT FILE DIRECTORY	Prints the name and directory of files that are stored in the printer on an optional hard disk.
PRINT PCL FONT LIST	Prints the available PCL fonts.
PRINT PS FONT LIST	Prints the available PS (emulated PostScript) fonts.

Paper handling menu

Use the **Paper handling** menu to configure input trays by size and type. This menu can also be used to set default media size and type. It is important to configure the trays correctly with this menu before you print for the first time.

NOTE If you have used previous HP LaserJet printers, you might be accustomed to configuring tray 1 to first mode or cassette mode. To mimic the settings for first mode, configure tray 1 for **SIZE = ANY** and **TYPE = ANY**. To mimic the settings for cassette mode, set either the size or type for tray 1 to a setting other than **ANY**.

Table 7-41 Paper handling menu

Menu item	Value	Description
TRAY 1 SIZE	A list of available sizes appears.	Use this item to configure the media size for tray 1. The default value is ANY.
TRAY 1 TYPE	A list of available types appears.	Use this item to configure the media type for tray 1. The default value is ANY.
TRAY <N> SIZE **(N = 2, 3, or 4)** **NOTE** The HP Color LaserJet 4610n printer does not support tray 3 or tray 3/ tray 4. **NOTE** A tray 4 setting is only available when the 2 x 500-sheet feeder is used with the HP Color LaserJet 4650 models.	A list of available sizes appears.	Use this item to configure the media size for tray 2, tray 3, or tray 4. The default setting is the size that is detected by the guides in the tray. To use a custom size, move the switch in the tray to custom.
TRAY <N> TYPE **(N = 2, 3, or 4)** **NOTE** The HP Color LaserJet 4610n printer does not support tray 3 or tray 3/ tray 4. **NOTE** A tray 4 setting is only available when the 2 x 500-sheet feeder is used with the HP Color LaserJet 4650 models.	A list of available types appears.	Use this item to configure the media type for tray 2, tray 3, or tray 4. The default is PLAIN.

Configure device menu

The **Configure device** menu has several submenus. Use these submenus to change the printer's default printing settings, adjust the print quality, change the system configuration and I/O options, and reset the printer to its default settings.

Printing menu

The settings in the **Printing** menu affect only jobs that do not have identified properties. Most jobs identify all of the properties and override the values from this menu.

Table 7-42 Printing submenu

Menu item	Values	Description
COPIES	1 to 32000	Use this item to set the default number of copies.
DEFAULT PAPER SIZE	A list of available sizes appears.	Use this item to set the default media size. This setting applies only to print jobs that do not have a paper size specified in the program or printer driver.
DEFAULT CUSTOM PAPER SIZE	UNIT OF MEASURE x DIMENSION Y DIMENSION	Use this item to set the default size for any job without dimensions.
DUPLEX **NOTE** This setting is not available for the HP Color LaserJet 4610n printer.	OFF ON	Use this item to enable or disable the duplex function on models that have duplexing capability.
DUPLEX BINDING **NOTE** This setting is not available for the HP Color LaserJet 4610n printer.	LONG EDGE SHORT EDGE	This item appears only if the duplexer is installed and if **DUPLEX** is set to ON. Use this item to specify which edge of the paper to use for binding duplex print jobs.
OVERRIDE A4/LETTER	NO YES	Use this item to set the printer to print an A4 job on letter-size paper when no A4 paper is loaded.
MANUAL FEED	ON OFF	Use this item to feed paper manually from tray 1, rather than automatically from a tray. If **MANUAL FEED = ON** and tray 1 is empty, the printer goes offline when it receives a print job. **MANUALLY FEED [PAPER SIZE]** appears on the printer control-panel display.
COURIER FONT	REGULAR DARK	Use this item to select a version of the Courier font. **REGULAR**: The internal Courier font that is available on the HP LaserJet 4 series printers.

Table 7-42 Printing submenu (continued)

Menu item	Values	Description
		DARK: The internal Courier font that is available on the HP LaserJet III series printers.
WIDE A4	NO YES	Use this item to change the number of characters that can be printed on a single line of A4-size paper. **NO**: Up to 78 10-pitch characters can be printed on one line. **YES**: Up to 80 10-pitch characters can be printed on one line.
PRINT PS ERRORS	OFF ON	Use this item to select whether to print PostScript (PS) error pages. **OFF**: PS error page never prints. **ON**: PS error page prints when PS errors occur.
PRINT PDF ERRORS (HP Color LaserJet 4610n and 4650 models only)	OFF ON	Use this item to select whether to print PDF error pages. **OFF**: PDF error page never prints. **ON**: PDF error page prints when PDF errors occur.
PCL	FORM LENGTH ORIENTATION FONT SOURCE FONT NUMBER FONT PITCH SYMBOL SET APPEND CR TO LF	Use this item to configure settings for the printer control language. **FORM LENGTH**: Use this item to set vertical spacing from 5 to 128 lines for the default paper size. **ORIENTATION**: Use this item to set the default page orientation to portrait or landscape. **FONT SOURCE**: Use this item to select the font source as **Internal**; **CARD SLOT 1, 2, or 3**; **Internal disk**, or **EIO disk**. **FONT NUMBER**: The printer assigns a number to each font and lists the numbers on the PCL font list. The range is 0 to 999. **FONT PITCH**: Use this item to select the font pitch. This item might not appear, depending on the font selected. The range is 0.44 to 99.99. **SYMBOL SET**: Use this item to select any one of several available symbol sets at the printer control panel. A symbol set is a unique grouping of all the characters in a font. PC-8 or PC-850 is recommended for line-draw characters.

Table 7-42 Printing submenu (continued)

Menu item	Values	Description
		APPEND CR TO LF: Select **YES** to append a carriage return to each line-feed that is encountered in backward-compatible PCL jobs (pure text, no job control). Some environments, such as UNIX, indicate a new line using only the line-feed control code. Use this option append the required carriage return to each line-feed.

Print quality menu

Use the **Print quality** menu to adjust all aspects of print quality, including calibration, registration, and color halftone settings.

Table 7-43 Print quality submenu

Menu item	Values	Description
ADJUST COLOR	CYAN DENSITY MAGENTA DENSITY YELLOW DENSITY BLACK DENSITY RESTORE COLOR VALUES	Use this item to modify the halftone settings for each color.
SET REGISTRATION **NOTE** A tray 4 setting is only available when the 2 x 500-sheet feeder is used with the HP Color LaserJet 4650 models.	PRINT TEST PAGE SOURCE ADJUST TRAY [N]	Use this item to shift the margin alignment in order to center the image on the page from top to bottom, and left to right. You can also align the image that is printed on the front with the image that is printed on the back. **PRINT TEST PAGE**: Use this item to print a test page that shows the current registration settings. **SOURCE**: Use this item to select the tray for which you want to print the test page. If installed, optional trays appear as selections, where [N] is the number of the tray. **ADJUST TRAY N**: Use this item to set the registration for the specified tray, where [N] is the number of the tray. A selection appears for each tray that is installed, and registration must be set for each tray. ■ **X1 SHIFT**: Registration of the image on the paper from side to side, as the paper lies in the tray. For duplexing, this side is the second side (back) of the paper. ■ **X2 SHIFT**: Registration of the image on the paper from side to side, as the paper lies in the tray, for the first side (front) of a duplexed page. This item appears only if a duplexer is installed and enabled. Set the **X1 SHIFT** first. ■ **Y SHIFT**: Registration of the image on the paper from top to bottom as the paper lies in the tray.
PRINT MODES	A list of available modes appears.	Change the print mode only if you are experiencing problems printing on

Table 7-43 Print quality submenu (continued)

Menu item	Values	Description
		certain media types. After you select a type of media, you can select a print mode that is available for that type.
OPTIMIZE	REDUCE (HP Color LaserJet 4610n and 4650 models only) BACKGROUND TRANSFER TRANSPARENCY (HP Color LaserJet 4610n and 4650 models only) FUSER WARMUP (HP Color LaserJet 4610n and 4650 models only) MEDIA TYPE (HP Color LaserJet 4610n and 4650 models only) RESTORE OPTIMIZE TRAY 1 (HP Color LaserJet 4610n/4650 models only)	Use this item to optimize certain parameters for all jobs rather than optimizing by media type.
CALIBRATE NOW (HP LaserJet 4600 models)		Use this item to perform all printer calibrations: D-Max, D-Half, color plane registration, and drum-phase adjustment.
QUICK CALIBRATE NOW (HP LaserJet 4610n and 4650 models only)		Use this item to perform a partial printer calibration (D-Max and D-Half) used for color-tone correction.
FULL CALIBRATE NOW (HP LaserJet 4610n and 4650 models only)		Use this item to perform a full printer calibration which includes D-max, D-Half, drum-phase calibration, and color-plane registration.

System setup menu

The **System setup** menu allows you to make changes to general printer configuration default settings such as PowerSave Time, printer personality (language), and jam recovery.

Table 7-44 System setup submenu

Menu item	Values	Description
JOB STORAGE LIMIT	1 to 100	Sets the limit for the maximum number of jobs that can be stored on the hard disk at the printer.
JOB HELD TIMEOUT	OFF 1 HOUR 4 HOURS 1 DAY 1 WEEK	Sets the period of time that the system keeps files in job storage before deleting them from the queue.
SHOW ADDRESS (HP Color LaserJet 4650 models)	AUTO OFF	This item determines whether the printer's IP address is shown on the display with the **Ready** message. If more than one EIO card is installed, the IP address of the card in the first slot is shown. The default is off.
COLOR/BLACK MIX =	AUTO MOSTLY COLOR PAGES MOSTLY BLACK PAGES	This menu item establishes how the printer switches from color to monochrome (black and white) mode for maximum performance and print cartridge life. **AUTO** will determine the mode the engine will enter based on the first page of a print job. If the first page is monochrome, the engine will enter mono mode until a color page is detected. It will then continue in color mode until the end of the job. If the first page is in color, the engine will enter color mode for the duration of the job. Select **MOSTLY COLOR PAGES** if nearly all of your print jobs are color with high page coverage. This will cause the engine to always run in color mode, even if the whole job is in monochrome. Select **MOSTLY BLACK PAGES** if you print mostly monochrome print jobs, or a combination of color and monochrome print jobs. This will cause the engine to switch back and forth between color and monochrome mode. If the first page is monochrome, the engine will enter mono mode until a color page is detected. It will then enter color mode. If 3 consecutive monochrome pages are detected, the

Table 7-44 System setup submenu (continued)

Menu item	Values	Description
		engine will switch back to monochrome mode again. If the first page is color, the engine will enter color mode until 3 consecutive monochrome pages are detected, at which point it will switch back to monochrome mode again.
TRAY BEHAVIOR	USE REQUESTED TRAY MANUALLY FEED PROMPT PS DEFER MEDIA	Use this item to specify settings for the tray-selection behavior. (Use this setting to configure the trays to behave like trays in some legacy HP printers, and to configure two-sided printing behavior for preprinted forms and letterhead.) **USE REQUESTED TRAY**: Determines whether the printer tries to pull paper from a tray other than the one that you selected in the printer driver. ■ **EXCLUSIVELY**: Sets the printer to pull paper only from the tray that you selected and not to pull from another tray automatically if the tray that you selected is empty. ■ **FIRST**: Sets the printer to pull from the tray that you selected first, but allows the printer to pull from another tray automatically if the tray that you selected is empty. The default for **USE REQUESTED TRAY** is **EXCLUSIVELY**. **MANUALLY FEED PROMPT**: Determines when the printer shows a prompt about pulling from tray 1 if the print job does not match the type or size that is loaded in any other tray. ■ **ALWAYS**: Select this option if the user always wants to be prompted before the printer pulls from tray 1. ■ **UNLESS LOADED**: Prompts only if tray 1 is empty. The default for **MANUALLY FEED PROMPT** is **ALWAYS**. **PS DEFER MEDIA** affects how paper is handled when printing from an Adobe® PS print driver. **ENABLED** uses HP's paper handling. **DISABLED** uses the Adobe PS paper handling. The default is **ENABLED**.
POWERSAVE TIME	Settings depend on the printer model.	Reduces power consumption when the printer has been inactive for the period of time specified by this item in order to reduce wear on the electronic

Table 7-44 System setup submenu (continued)

Menu item	Values	Description
		components in the printer. The printer automatically comes out of PowerSave mode when a job is sent to the printer.
PERSONALITY	AUTO PCL PS PDF (HP Color LaserJet 4610n/4650 models only) MIME (HP Color LaserJet 4610n/4650 models only)	Sets the default personality to automatic switching, PCL, PDF, or PostScript emulation.
CLEARABLE WARNINGS	ON JOB	Sets whether a warning is cleared on the control panel or when another job is sent. **ON**: The clearable warning message appears until you press ✓. **JOB**: The clearable warning message appears until the end of the job that generated the message. The default is **JOB**.
AUTO CONTINUE	ON OFF	Determines printer behavior when the system generates an auto-continuable error. **ON**: If an error occurs that prevents printing, the message appears on the printer control-panel display, and the printer goes offline for 10 seconds before returning online. **OFF**: If an error occurs that prevents printing, the message remains on the printer control-panel display, and the printer remains offline until you press ✓. The default is **ON**.
SUPPLIES LOW	CONTINUE STOP	Sets low supplies reporting options.
COLOR SUPPLY LOW	AUTOCONTINUE BLACK STOP	Sets the COLOR SUPPLY OUT printer behavior. When a color supply is empty and the printer is set to AUTOCONTINUE BLACK, the printer will continue printing using black toner only.
JOB STORAGE LIMIT	1 to 100	Sets the limit for the maximum number of jobs that can be stored on the hard disk at the printer.

Table 7-44 System setup submenu (continued)

Menu item	Values	Description
JAM RECOVERY	AUTO ON OFF	Use this item to sets whether the printer attempts to reprint pages after a jam. **AUTO**: The printer automatically selects the best mode for printer-jam recovery (usually **ON**). **ON**: The printer automatically reprints pages after a jam is cleared. **OFF**: The printer does not reprint pages following a jam. Printing performance might be increased with this setting. The default setting is **AUTO**.
LANGUAGE	A list of available languages appears.	Sets the default language.

I/O menu

Use the **I/O** menu to configure the printer I/O options.

Table 7-45 I/O submenu

Menu item	Values	Description
I/O TIMEOUT	5 to 300	Use this item to select the I/O timeout in seconds.
PARALLEL INPUT	HIGH SPEED ADVANCED FUNCTIONS	Use this item to select the speed at which the parallel port communicates with the host, and to enable or disable the bidirectional parallel communication. **HIGH SPEED**: Select **YES** to enable the printer to accept the faster parallel communications that are used for connections with newer computers. The default for **HIGH SPEED** is **YES**. **ADVANCED FUNCTIONS**: Turn the bidirectional parallel communication on or off. The default is set for a bidirectional parallel port (IEEE-1284). The function allows the printer to send status readback messages to the computer. (Turning on the advanced parallel functions might slow language switching.) The default for **ADVANCED FUNCTIONS** is **ON**.
EIO x (Where x=1, 2, or 3.) (HP Color LaserJet 4600/4650 only)	The following are the possible values: NOVELL DCL/LLC IPX/SPX TCP/IP APPLETALK	Use this item to configure the EIO devices installed in slot 1, 2, or 3.

Resets menu

Use the **Resets** menu to reset factory settings, disable and enable PowerSave, and update the printer after new supplies are installed.

Table 7-46 Resets menu

Menu item	Values	Description
RESTORE FACTORY SETTINGS	None	Use this item to clear the page buffer, remove all perishable personality data, reset the printing environment, and return all default settings to factory defaults.
POWERSAVE	ON OFF	Use this item to enable and disable PowerSave.
RESET SUPPLIES	NEW TRANSFER KIT NEW FUSER KIT	Use this item to inform the printer that a new transfer kit or new fuser kit has been installed.

Diagnostics menu

Use the **Diagnostics** menu to run tests that can help you identify and solve problems with the printer.

Table 7-47 Diagnostics menu

Menu item	Description
PRINT EVENT LOG	Prints an event log that shows the last 50 entries in the printer event log, starting with the most recent.
SHOW EVENT LOG	Shows the last 50 events on the control-panel display, starting with the most recent.
PQ TROUBLESHOOTING	Prints a series of print-quality assessment pages that help troubleshoot any print-quality problems.
DISABLE CARTRIDGE CHECK	Use this item to remove a print cartridge to help determine which cartridge is the source of the problem.
Paper Path SENSOR TEST (HP Color LaserJet 4610n and 4650 models only)	Use this item to perform a test on each of the printer sensors to determine if they are working correctly and displays the status of each sensor.
PAPER PATH TEST	Use this item to generate a test page that is useful for testing the paper-handling features of the printer. In the **PAPER PATH TEST** menu, select the source (tray), duplex setting, and number of copies, and then select **PRINT TEST PAGE**. Press ✓ to start the paper-path test. **SOURCE**: Select the tray that uses the paper path that you want to test. You can select any tray that is installed. Select **ALL TRAYS** to test all paper paths. Paper must be loaded in the selected trays. **COPIES**: Set how many sheets of paper are used from each tray during the paper-path test.
SENSOR TEST	Use this item to test the paper-path sensors and switches for correct operation.
MANUAL SENSOR TEST	Use this item to manually test the sensors and switches for correct operation.
COMPONENT TEST	Activates individual parts independently to isolate noise, leaking, and other hardware issues.
PRINT/STOP TEST	Isolates print-quality faults more accurately by stopping the printer in mid print cycle. Stopping the printer in mid-cycle allows you to see where the image begins to degrade.
COLOR BAND TEST (HP Color LaserJet 4610n and 4650 models only)	Use this item to print a color band test page that is used to identify arching in the high-voltage power supply.

Service menu

The **Service** menu is PIN-protected for added security. Only authorized service people have access to the service menu. When you select SERVICE from the list of menus, you are prompted to type an eight-digit PIN number. The PIN for HP Color LaserJet 4600 models is 04460002. The PIN for HP Color LaserJet 4610n and 4650 models is 05465004.

1. Press (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models) to open the **MENUS**.
2. Press to highlight **SERVICE**.
3. Press to select **SERVICE**.
4. Press or until the first digit of the PIN appears.
5. Press to save the digit. The control-panel display replaces the digit with an asterisk.
6. Repeat steps 4 and 5 until you have typed all eight digits.
7. Press at any time to move to the previous digit.

Use the **Service** menu to reset counts, clear the event log, specify the serial number, specify the date the printer was first used, and reset the default paper size.

Table 7-48 Service menu

Menu item	Values	Description
CLEAR EVENT LOG		Use this item to clear the printer's internal event log
TOTAL MONO PAGES HP Color LaserJet 4650 models)	Range: 0 to 9999999	Total mono pages printed
TOTAL COLOR PAGES HP Color LaserJet 4650 models)	Range: 0 to 9999999	Total color pages printed
REFURBISH PAGE COUNT HP Color LaserJet 4650 models)	Range: 0 to 9999999	Factory service setting.
TOTAL PAGE COUNT (HP Color LaserJet 4600 models)	Range: 0 to 9999999	Use this item to reset the page count after replacing the formatter. The page count should reflect the number of pages printed on the print engine rather than the formatter.
TRANSFER KIT COUNT	Range: 0 to 9999999 (120,000 is the maximum number of pages the transfer unit can print)	Use this item to reset the page count of the current transfer unit if the value is lost. This item automatically resets to zero when the transfer unit is replaced and the user selects to reset the transfer count.
FUSER KIT COUNT	Range: 0 to 9999999 (150,000 is the maximum number of pages the fuser can print)	Use this item to reset the page count of the current fuser if the value is lost. This item automatically resets to zero when the fuser is replaced and the user selects the to reset the fuser count.

Table 7-48 Service menu (continued)

Menu item	Values	Description
SERIAL NUMBER	A 10-digit number that varies by printer.	Use this item to update the serial number if you replace the formatter.
SERVICE ID	YYDD	If you replace the formatter, use this item to set the date to the date that the printer was first used, rather than the date that the new formatter was installed.
COLD RESET PAPER	LETTER A4	If the customer uses default paper size of A4 (used in Europe), use this item to reset the default if you replace the formatter.

Tools for troubleshooting

Embedded Web server (HP Color LaserJet 4600 and 4650 models only)

When the printer is directly connected to a computer, the embedded Web server is supported for Windows 95 and later. In order to use the embedded Web server with a direct connection, you must select the Custom installation option when you install the printer driver. Select the option to load Printer Status and Alerts. The proxy server is installed as part of the Printer Status and Alerts software.

When the printer is connected to the network, the embedded Web server is automatically available. You can gain access to the embedded Web server from Windows 95 and later.

Use the embedded Web server to view printer and network status and to manage printing functions from your computer instead of from the printer control panel. The following are are examples of what you can do when you are using the embedded Web server:

- View printer control-status information
- Set the type of media that is loaded in each tray
- Determine the remaining life of all supplies and order new ones
- View and change tray configurations
- View and change the printer control-panel menu configuration
- View and print internal pages
- Receive notification of printer and supplies events
- View and change the network configuration

To use the embedded Web server, you must have Microsoft Internet Explorer 4 or late or Netscape Navigator 4 or later. The embedded Web server works when the printer is connected to an IP-based network. The embedded Web server does not support IPX-based printer connections. You do not have to have Internet access to open and use the embedded Web server.

To open the embedded Web server

In a supported Web browser on your computer, type the IP address for the printer. (To find the IP address, print a configuration page.)

NOTE After you open the URL, you can bookmark it so that you can return to it quickly in the future.

1. The embedded Web server has three tabs that contain settings and information about the printer: the **Information** tab, the **Settings** tab, and the **Network** tab. Click the tab that you want to view.
2. See the following sections for more information about each tab.

Information tab

The Information pages group consists of the following screens:

- **Device Status**. Shows the printer status and the life remaining for HP supplies, with 0% representing that a supply is empty. The page also shows the type and size of print media that is set for each tray. To change the default settings, click **Change Settings**.
- **Configuration page**. Shows the information that is also found on the printer configuration page.
- **Supplies Status.** Shows the life remaining of HP supplies, with 0% representing that a supply is empty. This screen also provides supplies part numbers. To order new supplies, click **Order Supplies** in the **Other Links** area on the left side of the window. To visit any Web site, you must have Internet access.
- **Event log**. Shows a list of all printer events and errors.
- **Usage page**. Shows a summary of the number of pages that the printer has printed, grouped by size and type.
- **Device Information.** Shows the printer network name, address, and model information. To change these entries, click **Device Information** on the **Settings** tab.

Settings tab

Use this tab to configure the printer from your computer. The **Settings** tab can be password protected. If this printer is networked, always consult with the printer administrator before changing settings on this tab.

The **Settings** tab contains the following screens.

- **Configure Device.** Use this screen to configure all printer. This screen contains the traditional menus that are found on printers that use a control-panel display: **Information**, **Paper Handling**, **Configure Device**, and **Diagnostics**.
- **Alerts.** For networks only. Use this screen to set up e-mail alerts for various printer and supplies events.
- **E-mail.** For networks only. Use this screen in conjunction with the Alerts screen to set up incoming and outgoing e-mail, as well as to set e-mail alerts.
- **Security.** Use this screen to set a password that must be typed in order to gain access to the **Settings** and **Networking** tabs. Enable and disable certain features of the EWS.
- **Other Links.** Use this screen to add or customize a link to another Web site. The created link appears in the **Other Links** area on all embedded Web server pages. The following permanent links always appear in the **Other Links** area: **HP Instant Support**, **Order Supplies**, and **Product Support**.
- **Device Information.** Use this screen to name the printer and assign an asset number to it. Type the name and e-mail address for the primary contact who will receive information about the printer.
- **Language.** Use this screen to specify the language in which the embedded Web server information appears.

Networking tab

The network administrator can use this tab allows to control network-related settings for the printer when it is connected to an IP-based network. This tab will not appear if the printer is directly connected to a computer, or if the printer is connected to a network with anything other than an HP Jetdirect print server card.

Other links

This section contains links that connect you to the Internet. You must have Internet access in order to use any of these links. If you use a dial-up connection and did not connect when you first opened the embedded Web server, you must connect before you can visit these Web sites. Connecting might require that you close the embedded Web server and reopen it.

- **HP Instant Support** connects you to the HP Web site to help you find solutions. This service analyzes your printer error log and configuration information to provide diagnostic and support information that is specific to your printer.
- **Order Supplies** connects to the HP Web site where you can order genuine HP supplies, such as print cartridges and paper.
- **Product Support** connects to the support site for the HP Color LaserJet 4600 Series printer, where you can search for help regarding general topics.

Printer Status and Alerts software

Printer Status and Alerts is supported only for Windows 95 and later versions.

The Printer Status and Alerts software is available to users of both networked and directly connected printers. To use Printer Status and Alerts software with a directly connected computer, you must select the Custom installation option when you install the printer driver. Select the option to install Printer Status and Alerts. For network connections, Printer Status and Alerts is installed automatically with the Typical software installation option.

Use this software to view the embedded Web server information for a particular printer. The software also generates messages on the computer that provide the status of the printer and print jobs. Depending on how the printer is connected, you can receive different messages.

- **Networked printers.** You can receive regular job-status messages that appear every time a print job is sent to the printer or every time the print job finishes printing. You can also receive alerts messages. These messages appear when you are printing to a particular printer if that printer experiences a problem. In some cases, the printer can continue to print (such as when a tray that is not being used is open, or a print cartridge is low). In other cases, a problem might prevent the printer from printing (such as when the media is out, or a print cartridge is empty).
- **Directly connected printers.** You can receive alerts messages that appear when the printer experiences a problem but can continue printing or a problem that prevents it from printing. You can also receive messages that indicate that the print cartridge is low.

You can set alert options for a single printer that supports Printer Status and Alerts, or you can set alert options for all printers that support Printer Status and Alerts. For networked printers, these alerts only appear for your jobs.

Note that even if you are setting alert options for all printers, not all of the options that you select will apply to all printers. For example, when selecting the option to notify you when the print cartridges are low, directly connected printers that support Printer Status and Alerts will generate a message

when the print cartridges are low. However, none of the networked printers will generate this message unless it affects a user-specific job.

To specify which status messages appear

1. Open Printer Status and Alerts in one of these ways:
   - Double-click the **Printer Status and Alerts** tray icon, which is near the clock in the Tray Manager.
   - On the Start menu, point to **Programs**, point to **Printer Status and Alerts**, and click **Printer Status and Alerts**.
2. Click the **Options** icon in the left pane.
3. In the **For** field, select the printer driver for this printer, or select **All Printers**.
4. Clear the options for the messages that you do not want to appear, and select the options for the messages that you do want to appear.
5. In **Status check rate**, select how frequently you want the software to update the printer status information that the software uses to generate the messages. Status Check Rate might not be available if the printer administrator has restricted the rights to this function.

To view status messages and information

On the left side of the window, select the printer for which you want to see information. The information that is provided includes status messages, supplies status, and printer capabilities. You can also click the Job History (clock) icon at the top of the window to view a list of previous jobs that were sent to the printer from your computer.

Printer information pages

From the control panel, you can print pages that give details about the printer and its current configuration.

Menu map

The menu map shows the layout of the printer menus and current printer settings. This can help you restore any user configured-settings after the printer is serviced.

1. Press (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models) to open the **MENUS**.
2. Press to highlight **INFORMATION**.
3. Press to select **INFORMATION**.
4. Press to highlight **PRINT MENU MAP**.
5. Press to select **PRINT MENU MAP**.

Configuration page

Use the configuration page to view current printer settings, to help troubleshoot printer problems, or to verify installation of optional accessories, such as memory (DIMMs), paper trays, and printer languages.

1. Press (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models) to open the **MENUS**.
2. Press to highlight **INFORMATION**.
3. Press to select **INFORMATION**.
4. Press to highlight **PRINT CONFIGURATION**.
5. Press to select **PRINT CONFIGURATION**.

The message **PRINTING... CONFIGURATION** appears on the control-panel display until the printer finishes printing the configuration page. The printer returns to the **Ready** state after printing the configuration page.

NOTE If the printer is configured with EIO cards (for example, an HP Jetdirect Print Server) or an optional hard-disk drive, an additional configuration page will print that provides information about those devices.

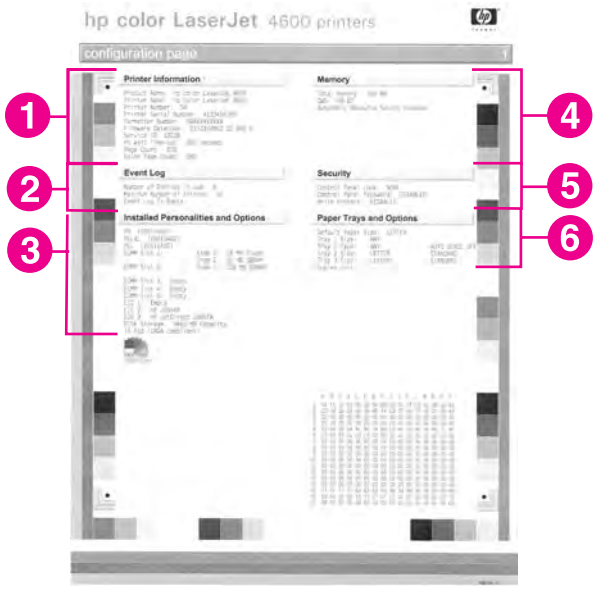


Figure 7-7 Printer configuration page (HP Color LaserJet 4600 models)

1	Printer information
2	Event log
3	Installed personalities and options
4	Memory
5	Security
6	Trays and options

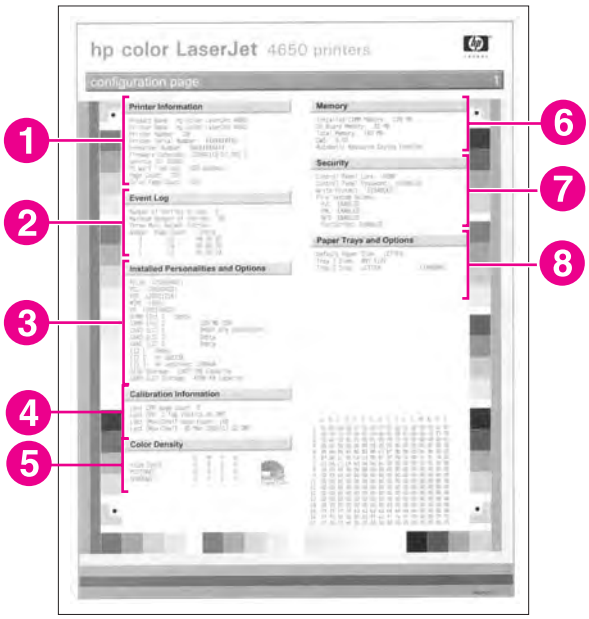


Figure 7-8 HP Color LaserJet 4610n and 4650 model configuration page

1	Printer information
2	Event log
3	Installed personalities and options
4	Calibration information
5	Color density
6	Memory
7	Security
8	Trays and options

Supplies status page

The supplies status page illustrates the remaining life for the following printer supplies:

- Print cartridges (all colors)
- Transfer unit
- Fuser

To print the supplies status page:

1. Press (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models) to open the **MENUS**.
2. Press to highlight **INFORMATION**.
3. Press to select **INFORMATION**.
4. Press to highlight **PRINT SUPPLIES STATUS**.
5. Press to select **PRINT SUPPLIES STATUS**.

The message **PRINTING... SUPPLIES STATUS** appears on the control-panel display until the printer finishes printing the supplies status page. The printer returns to the **Ready** state after printing the supplies status page.

NOTE If you are using non-HP supplies, the supplies status page will not show the remaining life for the supplies. The supplies status page for the HP Color LaserJet 4600 and 4610n models contains the same supplies information as the page shown in Figure 7-9 Supplies status page (HP Color LaserJet 4610n/4650 model is shown).

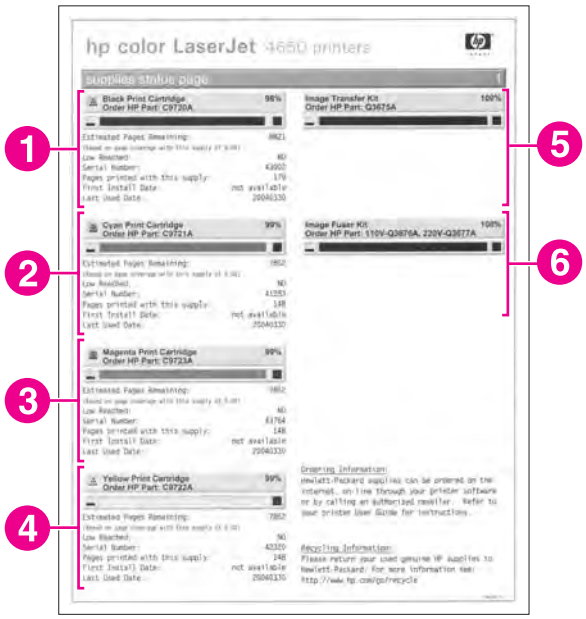


Figure 7-9 Supplies status page (HP Color LaserJet 4610n/4650 model is shown)

1	Black print cartridge information
2	Cyan print cartridge information

3	Magenta print cartridge information
4	Yellow print cartridge information
5	Image transfer kit (ETB) information
6	Image fuser kit information

Usage page

The usage page lists a page count for each size of media that has passed through the printer. This page count includes the number of pages that were printed on one side, the number that were printed on two sides (duplexed), and totals of the two printing methods for each media size. It also lists the average percentage of page coverage for each color.

1. Press (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models) to open the **MENUS**.
2. Press to highlight **INFORMATION**.
3. Press to select **INFORMATION**.
4. Press to highlight **PRINT USAGE**.
5. Press to select **PRINT USAGE**.

The message **PRINTING... USAGE** appears on the control-panel display until the printer finishes printing the usage page. The printer returns to the **Ready** state after printing the usage page.

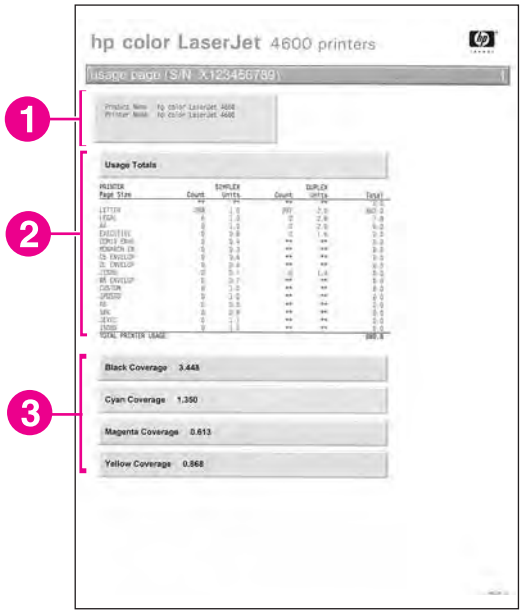


Figure 7-10 Usage page (HP Color LaserJet 4600 models)

1	Printer identification information
2	Usage totals
3	Historical printer coverage by color

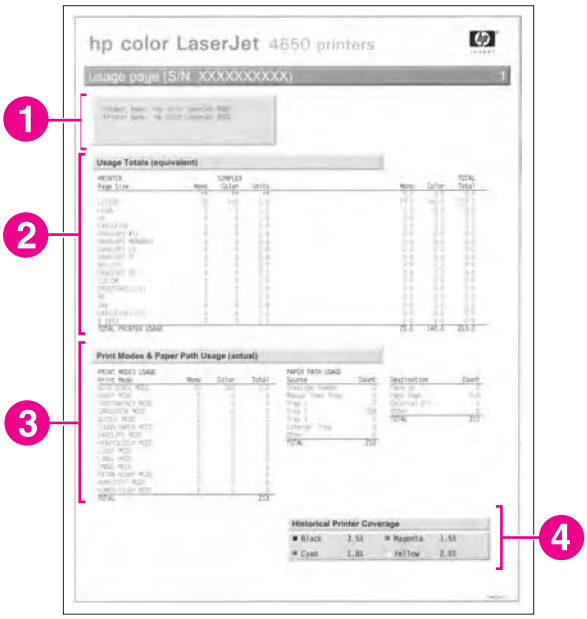


Figure 7-11 Usage page (HP Color LaserJet 4610n and 4650 models)

1	Printer identification information
2	Usage totals
3	Print modes and paper path usage
4	Historical printer coverage by color

Demo page

The printer can produce a print-quality demonstration page.

1. Press ✓ (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models) to open the **MENUS**.
2. Press ▼ to highlight **INFORMATION**.
3. Press ✓ to select **INFORMATION**.
4. Press ▼ to highlight **PRINT DEMO**.
5. Press ✓ to select **PRINT DEMO**.

The message **PRINTING... DEMO** appears on the control-panel display until the printer finishes printing the demo page. The printer returns to the **Ready** state after printing the demo page.

File directory page

The file directory page lists the files and directories that are stored in printer memory or on the hard drive (not all printer models come with a hard drive).

1. Press (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models) to open the **MENUS**.
2. Press to highlight **INFORMATION**.
3. Press to select **INFORMATION**.
4. Press to highlight **PRINT FILE DIRECTORY**.
5. Press to select **PRINT FILE DIRECTORY**.

The message **PRINTING... FILE DIRECTORY** appears on the control-panel display until the printer finishes printing the file directory page. The printer returns to the **Ready** state after printing the file directory page.

NOTE The file directory page for the HP Color LaserJet 4600 and 4610n models contains the same file directory page information as the page shown in Figure 7-12 File directory page (HP Color LaserJet 4650 models is shown).

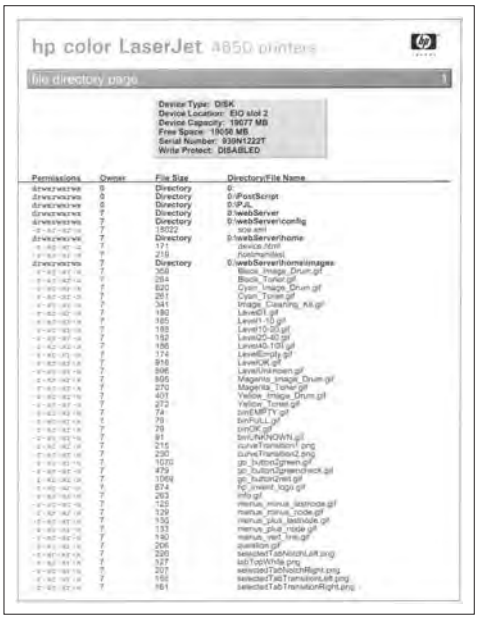


Figure 7-12 File directory page (HP Color LaserJet 4650 models is shown)

PCL font list page

The PCL font list page list the PCL fonts that are available on the printer.

1. Press (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models) to open the **MENUS**.
2. Press to highlight **INFORMATION**.
3. Press to select **INFORMATION**.

4 Press ▼ to highlight **PRINT PCL FONT LIST**.

5 Press ✓ to select **PRINT PCL FONT LIST**.

The message **PRINTING... PCL FONT LIST** appears on the control-panel display until the printer finishes printing the PCL fonts list page. The printer returns to the **Ready** state after printing the PCL font list page.

NOTE The PCL font list page for the HP Color LaserJet 4600 and 4610n models contains the same PCL font list page information as the page shown in Figure 7-13 PCL font list page (HP Color LaserJet 4610n/4650 models is shown).

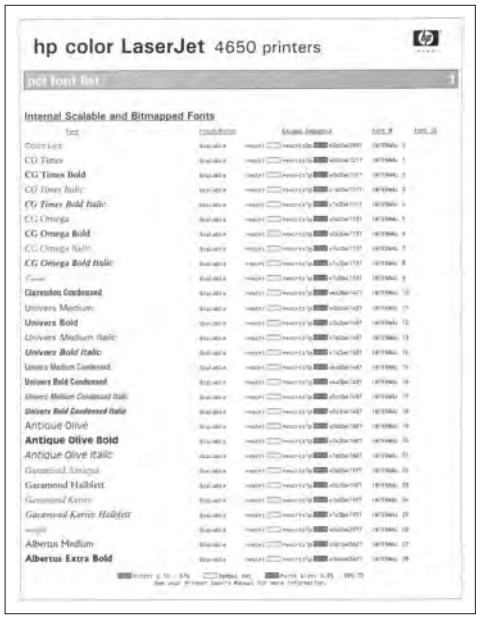


Figure 7-13 PCL font list page (HP Color LaserJet 4610n/4650 models is shown)

PS font list page

The PS font list page list the PS fonts (emulated PostScript) that are available on the printer.

1 Press (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models) to open the **MENUS**.

2 Press to highlight **INFORMATION**.

3 Press to select **INFORMATION**.

4 Press to highlight **PRINT PS FONT LIST**.

5 Press to select **PRINT PS FONT LIST**.

The message **PRINTING... PS FONT LIST** appears on the control-panel display until the printer finishes printing the PS fonts list page. The printer returns to the **Ready** state after printing the PS font list page.

NOTE The PS font list page for the HP Color LaserJet 4600 models contains the same PS font list page information as the page shown in Figure 7-14 PS font list page.

Figure 7-14 PS font list page

RGB samples page (HP Color LaserJet 4610n and 4650 models)

The RGB samples page is used for RGB color matching on the HP Color LaserJet 4610n and 4650 models.

1 Press MENU to open the **MENUS**.

2 Press to highlight **INFORMATION**.

3 Press to select **INFORMATION**.

4 Press ▼ to highlight **PRINT RGB SAMPLES**.

5 Press✓ to select **PRINT RGB SAMPLES**.

The message **PRINTING... RGB SAMPLES** appears on the control-panel display until the printer finishes printing the RGB samples page. The printer returns to the **Ready** state after printing the RGB samples page.

Figure 7-15 RGB samples page (HP Color LaserJet 4610n and 4650 models)

CMYK samples page (HP Color LaserJet 4610n and 4650 only)

The CMYK samples page is used for CMYK color matching on the HP Color LaserJet 4610n and 4650 models.

1 Press MENU to open the **MENUS**.

2 Press ▼ to highlight **INFORMATION**.

3 Press✓ to select **INFORMATION**.

4 Press ▼ to highlight **PRINT CMYK SAMPLES**.

5 Press✓ to select **PRINT CMYK SAMPLES**.

The message **PRINTING... CMYK SAMPLES** appears on the control-panel display until the printer finishes printing the CMYK samples page. The printer returns to the **Ready** state after printing the CMYK samples page.

Figure 7-16 CMYK samples page (HP Color LaserJet 4610n and 4650 models)

Diagnostics

LED diagnostics

Use the following procedure to help identify the cause of high-level printer problems. These problems are indicated by abnormalities in the printer's power-on sequence. The LED that the procedure refers to is on the formatter (callout 1). This is a “heartbeat” LED that blinks on and off when the formatter is operating correctly. Use Figure 7-17 HP Color LaserJet 4600 Series formatters to locate the formatter LED.

1 Does the LED blink with four fast burst at power on? If no, then perform the following checks.

- Check the firmware.
- Check the memory.
- Check the formatter.

2 Does the LED blink at a fast, steady rate during memory testing (one blink per 8 MB)? If no, then perform the following checks.

- Check the control-panel display for an error code.
- Check the memory.
- Check the formatter.

3 Is the LED off for about eight seconds, while the boot code is decompressing, before the display turns on? If no, then perform the following checks.

- Check the firmware.
- Check the control-panel display for correct connections and operation.
- Check the control-panel display for an error code.

4 Does the LED blink at a steady rate of one blink per second? If no, then perform the following checks.

- Check the firmware.
- Check the formatter.
- Check the control-panel display for an error code.

5 If the control-panel display does not illuminate, perform an engine test to check the engine. You must have paper loaded in tray 2 for the engine test.

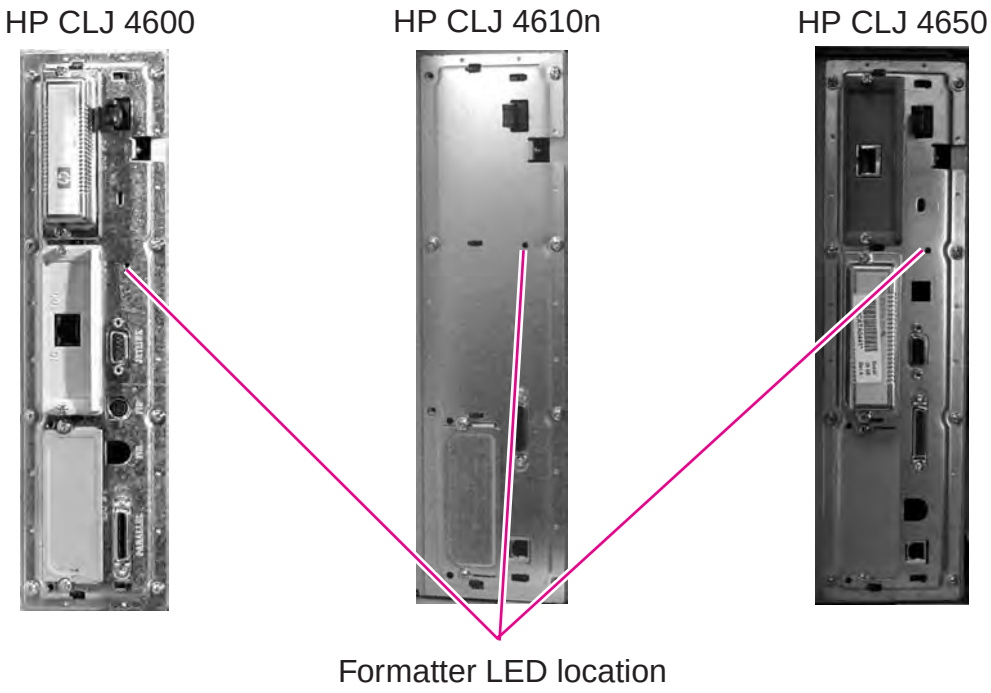


Figure 7-17 HP Color LaserJet 4600 Series formatters

Engine diagnostics

This section provides an overview of the engine diagnostics that are available in the HP Color LaserJet 4600 Series printer. The printer contains extensive internal diagnostics that help in troubleshooting print-quality, paper-path, noise, component, and timing issues.

Diagnostics mode

Some of the diagnostic tests automatically put the printer into a special diagnostics mode. During the special diagnostics mode the printer can perform actions that would normally cause the printer to enter an error state. Always follow the control-panel directions in the **Diagnostic** menu to exit the special diagnostics mode correctly and return the printer to a normal state.

Diagnostics that put the engine into the special diagnostics mode

Four diagnostic tests put the engine into a special state:

- Disable cartridge check
- Sensor test
- Manual sensor test
- Component test

While the printer is in the special diagnostics mode, the following message should appear:

READY DIAGNOSTICS MODE

TO EXIT PRESS CANCEL JOB KEY (HP Color LaserJet 4600 models)

TO EXIT PRESS STOP KEY (HP Color LaserJet 4610n and 4650 models)

When the printer is in the special diagnostics mode, these four tests appear in the menu and are available. To gain access to other diagnostic tests or to leave the diagnostic mode, press CANCEL JOB (HP Color LaserJet 4600 models) or STOP (HP Color LaserJet 4610n and 4650 models) button, and then select **Exit**. The printer will reset itself, and then return to the normal state.

NOTE You need to have a good understanding of how the printer operates in order to use the engine diagnostics successfully. Before proceeding with these diagnostic tests, make sure that you understand the information in chapter 5 of this manual.

Diagnostic tests

Different tests can be used to isolate different types of issues. For component or noise isolation, you can run the diagnostic test after removing the covers. Removing the covers provides a better view of the areas that are being tested. To operate the printer with the covers removed, the door switch (SW4, callout 1) lever must be depressed (this is the door-closed position) and you must depress the ETB connector (callout 2) after closing the ETB.

WARNING! Be careful when performing printer diagnostics to avoid risk of injury. Only trained service personnel should open and run the diagnostics with the covers removed. Never touch any of the power supplies when the printer is turned on.

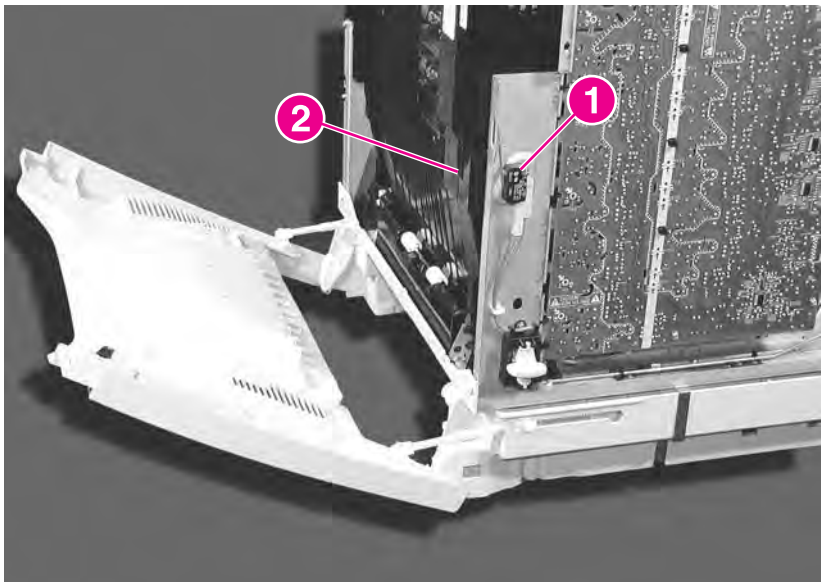


Figure 7-18 Door switch and ETB connector

NOTE Any time a cartridge is installed or removed while the covers are removed, the door interlock must be cycled to simulate opening and closing the top cover in order for the engine to recognize the change. The ETB must be closed and its connector must be depressed before cycling the door switch, or the printer will generate a 59.90 Printer Error. When the covers are installed, the door switch and ETB connector are automatically operated. When the covers are removed, you must perform these steps manually.

Individual diagnostic tests

The following sections explain in more detail how to operate the various diagnostics correctly.

Print the event log page

The event log lists the printer events, including jams, service errors, and other printer conditions.

1. Press (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models) to open the **MENUS**.
2. Press to highlight **DIAGNOSTICS**.
3. Press to select **DIAGNOSTICS**.
4. Press to highlight **PRINT EVENT LOG**.
5. Press to select **PRINT EVENT LOG**.

The message **PRINTING... EVENT LOG** appears on the control-panel display until the printer finishes printing the event log. The printer returns to the **Ready** state after printing the event log.

View the event log on the control-panel display

The show event log lists the last 50 printer events on the control-panel display. (The most recent event is listed first).

1. Press (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models) to open the **MENUS**.
2. Press to highlight **DIAGNOSTICS**.
3. Press to select **DIAGNOSTICS**.
4. Press to highlight **SHOW EVENT LOG**.
5. Press to select **SHOW EVENT LOG**.

Print the PQ troubleshooting pages

The PQ troubleshooting pages are a series of print-quality assessment pages that you can use to troubleshoot print-quality problems. Follow the instructions on page one of the PQ troubleshooting pages to solve print-quality problems.

1. Press (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models) to open the **MENUS**.
2. Press to highlight **DIAGNOSTICS**.
3. Press to select **DIAGNOSTICS**.
4. Press to highlight **PQ TROUBLESHOOTING**.
5. Press to select **PQ TROUBLESHOOTING**.

The message **PRINTING... PQ TROUBLESHOOTING** appears on the control-panel display until the printer finishes printing the PQ troubleshooting pages. The printer returns to the **Ready** state after printing the PQ troubleshooting pages.

Disable cartridge check (special mode test)

Use this diagnostic test to print internal pages or send an external job to the printer when one or more print cartridges are removed or exchanged. Because the cartridges are not keyed, the diagnostic test can be run when one to four cartridges have been removed or moved to another location (exchanged). Consumable supply errors are ignored while the printer is in this mode. When the printer is in this mode, you can navigate the menus and print internal pages or send an external print job to the printer. This diagnostic test can be used to isolate print-quality problems that are related to individual cartridges and to isolate individual cartridge problems, such as noise.

NOTE Do not remove or exchange cartridges before you start the disable cartridge check diagnostic. After starting the test, you can remove or exchange cartridges.

1. Press (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models) to open the **MENUS**.
2. Press to highlight **DIAGNOSTICS**.
3. Press to select **DIAGNOSTICS**.
4. Press to highlight **DISABLE CARTRIDGE CHECK**.
5. Press to select **DISABLE CARTRIDGE CHECK**.

To exit this diagnostic test, press the CANCEL JOB button (HP Color LaserJet 4600 models) or STOP (HP Color LaserJet 4610n and 4650 models) and then select **Exit diagnostics**.

Paper path sensor test (HP Color LaserJet 4610n and 4650 models)

This test displays the status of each paper path sensor.

1. Press MENU to open the **MENUS**.
2. Press to highlight **DIAGNOSTICS**.
3. Press to select **DIAGNOSTICS**.
4. Press to highlight **PAPER PATH SENSOR TEST**.
5. Press to select **PAPER PATH SENSOR TEST**.
6. The printer displays a message that has a row of letters followed by a row of numbers. Each letter corresponds with the number that is directly below it. The letters represent a sensor in the paper path, and the numerals indicate the status of the sensor. The numerial “0” indicates that no paper is present, and “1” indicates that paper is present. See Table 7-50 Sensor-test letter codes to determine which sensor is associated with each letter.

   NOTE The number of alpha and numeric characters varies according to the number of trays that are installed.

7. To exit the test, press STOP.
8. The message **NO JOB TO CANCEL** appears, and the printer enters the **READY DIAGNOSTICS** mode. To exit, press STOP.

9 The **DIAGNOSTICS** menu appears on the control-panel display. Press ▼ to highlight **EXIT DIAGNOSTICS**.

10 Press ✓ to select **EXIT DIAGNOSTICS**.

11 The message **WAITING FOR PRINTER TO RE-INITIALIZE** appears. The printer returns to the Ready state after initialization is complete.

Paper-path test

This diagnostic test generates one or more test pages that you can use to isolate the cause of jams.

To isolate a problem, you can specify which input tray to use, specify whether to use the duplex path, and specify the number of copies to print. Multiple copies can be printed to help isolate intermittent problems. The following options become available after you start the diagnostic feature:

- **Print test page**. Run the paper path test from the default settings: tray 2, no duplex, and one copy. To specify other settings, scroll down the menu and select the setting, and then scroll back up and select **PRINT TEST PAGE** to start the test.
- **Source**. Select tray 1, tray 2, tray 3 (if the single 500-sheet paper feeder or the 2 x 500-sheet feeder is installed), or tray 4 (if the 2 x 500-sheet feeder is installed).

  NOTE The HP Color LaserJet 4610n does not support tray 3 or tray 3/4.

- **Duplex**. Enable or disable 2-sided printing. (HP Color LaserJet 4600 and 4650 models only.)
- **Copies**. Set the numbers of copies to be printed; the choices are 1,10, 50, 100, or 500.

1 Press✓ (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models) to open the **MENUS**.

2 Press ▼ to highlight **DIAGNOSTICS**.

3 Press✓ to select **DIAGNOSTICS**.

4 Press ▼ to highlight **PAPER PATH TEST**.

5 Press✓ to select **PAPER PATH TEST**.

6 Select the paper path test options when the printer prompts you.

Sensor Test (special mode test)

Use this diagnostic test to test the printer sensors and switches. Each sensor is represented by a letter and number on the control-panel display. See Table 7-50 Sensor-test letter codes for a definition of the sensor letter codes. A 1 below the letter indicates that paper is present. For the paper size sensor, the range of values is from 0 to 7. Figure 7-19 Tray 2 paper size-switch arrangement indicates the switch state and paper size that are associated with each of these values (the tray 3, or tray 4 paper size switches for the single 500-sheet feeder and the 2 x 500-sheet feeder are similar to the tray 2 switch).

NOTE The HP Color LaserJet 4610n does not support tray 3 or tray 3/tray 4. To eliminate the flickering on the control-panel display during this test, you can leave the door switch in the open state.

1. Press (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models) to open the **MENUS**.
2. Press ▼ to highlight **DIAGNOSTICS**.
3. Press to select **DIAGNOSTICS**.
4. Press ▼ to highlight **SENSOR TEST**.
5. Press to select **SENSOR TEST**.

To exit this diagnostic, press the CANCEL JOB button (HP Color LaserJet 4600 models) or STOP (HP Color LaserJet 4610n and 4650 models) and then select **Exit diagnostics**.

Menus cannot be opened during component tests, so ✓ serves the same function as CANCEL JOB (HP Color LaserJet 4600 models) or STOP (HP Color LaserJet 4610n and 4650 models).

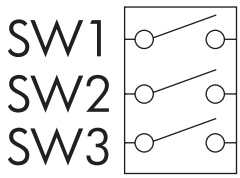


Figure 7-19 Tray 2 paper size-switch arrangement

Table 7-49 Tray 2 paper-size codes

Size code	Switch state			Paper size
	SW1	SW2	SW3	
0	On	On	On	Custom (see note below)
1	Off	On	On	Letter
2	On	Off	On	A5
3	Off	Off	On	Legal
4	On	On	Off	B5 (JIS)
5	Off	On	Off	Executive
6	On	Off	Off	A4
7	Off	Off	Off	tray not installed

NOTE Depressing all three switches of the tray 2 paper size levers causes the **Custom paper** menu to appear on the control-panel display. Press the ◄ button to return to the sensor diagnostic screen.

To toggle a sensor, find and move the sensor flags in the following locations. Table 7-50 Sensor-test letter codes describes how to find the following sensors.

- **A**. Remove tray 2. The flag is located in the center paper inlet path of the paper pickup unit, directly in front of the right-side white roller. The flag is recessed above the registration shutter in the paper pickup unit.

> ⚠ **WARNING!** The fuser might be hot; wait 10 minutes for it to cool down.

- **B**. Open the ETB and wait for the fuser to cool down. The fuser inlet flag is located at the front center of the fuser. Reach the flag from above the black print cartridge.
- **C**. The fuser delivery flag is located at the upper center of the fuser, behind the fuser Caution label. It is wrapped in a clear roller.
- **D**. The output bin full sensor is located on the upper, rear edge of the fuser.
- **E**. Remove tray 2. The tray 1 (multipurpose tray) paper-presence sensor flag is the black lever on the front right of the paper tray cavity.
- **F**. Remove tray 2. The tray 2 paper presence sensor flag is the black lever in the middle center of the paper tray cavity.
- **G**. Remove tray 2. The tray 2 paper size sensor switches are located on the left, rear side of the paper tray cavity.
- **H**. The door switch is located on the right, front of the printer frame (underneath the right cover).
- **H**. Remove tray 3. The tray 3 paper presence sensor flag is the black lever in the middle center of the paper tray cavity.
- **I**. Remove tray 3. The tray 3 paper size sensor switches are located on the left, rear side of the paper tray cavity.
- **J**. Remove tray 4. The tray 4 paper presence sensor flag is the black lever in the middle center of the paper tray cavity.
- **K**. Remove tray 4. The tray 4 paper size sensor switches are located on the left, rear side of the paper tray cavity.
- **L**. The door switch is located on the right, front of the printer frame (underneath the right cover).

Table 7-50 Sensor-test letter codes

Letter	Sensor	Sensor/switch number	Idle value (doors closed, paper in trays 1 and 2)
A	Top of page	PS 3	0
B	Fuser inlet speed	PS11	1
C	Fuser delivery	PS12	0
D	Output bin full	PS13	0
E	MP tray paper-presence	PS2	0
F	Tray 2 paper-presence	PS1	0

Table 7-50 Sensor-test letter codes (continued)

Letter	Sensor	Sensor/switch number	Idle value (doors closed, paper in trays 1 and 2)
G	Tray 2 paper size	SW1, SW2, SW3	0 to 7
H	Door	SW4	1
H	Tray 3 paper-presence	PS1	0
I	Tray 3 paper size	SW1, SW2, SW3	0 to 7
J	Tray 4 paper-presence	PS1	0
K	Tray 4 paper size	SW1, SW2, SW3	0 to 7
L	Door	SW4	1

Manual sensor test (special mode test; HP Color LaserJet 4610n and 4650 models)

Use this procedure to test paper-path sensors and the door-open switch manually. The following figures and tables show the locations of these sensors.

1. Press (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models) to open the **MENUS**.
2. Press to highlight **DIAGNOSTICS**.
3. Press to select **DIAGNOSTICS**.
4. Press to highlight **MANUAL SENSOR TEST**.
5. Press to select **MANUAL SENSOR TEST**.
6. Open and close doors or move sensor flags to see the sensor status change on the control-panel display.

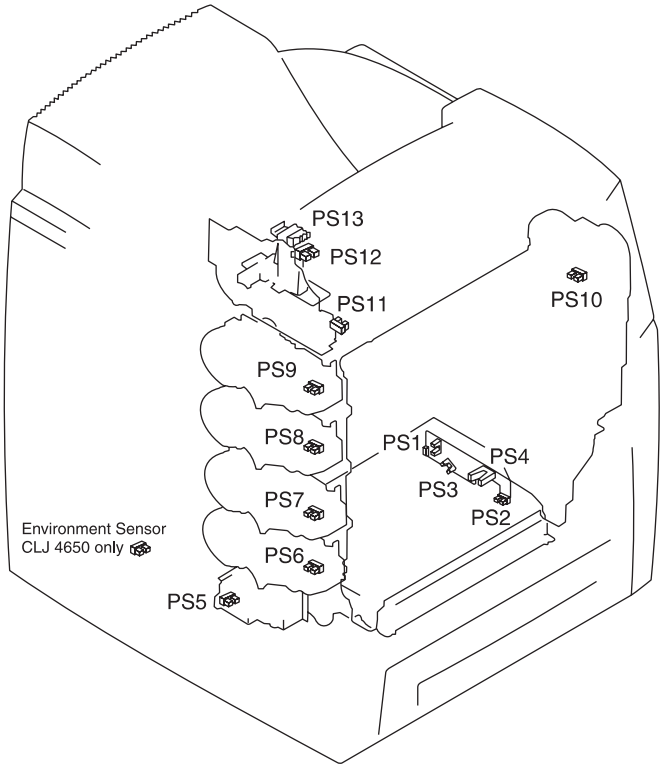


Figure 7-20 Location of sensors

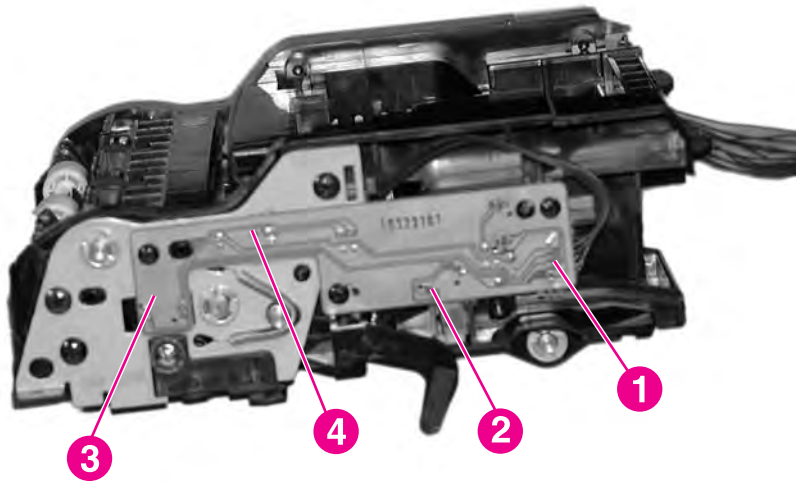


Figure 7-21 Sensors on the the paper pickup unit (the sensors are on the back side of the PCA)

1	Cassette-paper sensor (PS1)
2	Multipurpose-tray paper sensor (PS2)
3	Paper leading-edge sensor (PS3)
4	Overhead transparency sensor (PS4)

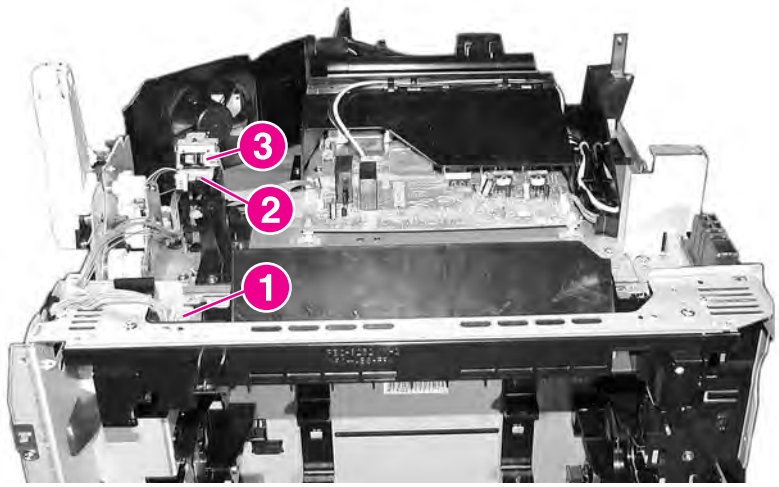


Figure 7-22 Fuser sensors and output bin full sensor

1	Fuser inlet paper sensor (PS11)
2	Fuser delivery sensor (PS12)
3	Output bin full sensor (PS13)

Table 7-51 Sensors

Name	Function
PS1	Cassette paper-present sensor
PS2	Multipurpose-tray paper-present sensor
PS3	Paper leading-edge sensor
PS4	Overhead transparency sensor
PS5	Developing disengagement sensor
PS6	Cyan drum home-position sensor
PS7	Yellow drum home-position sensor
PS8	Magenta drum home-position sensor
PS9	Black drum home-position sensor
PS10	ETB speed sensor
PS11	Fuser inlet paper sensor
PS12	Fuser delivery sensor
PS13	Output bin paper-full sensor

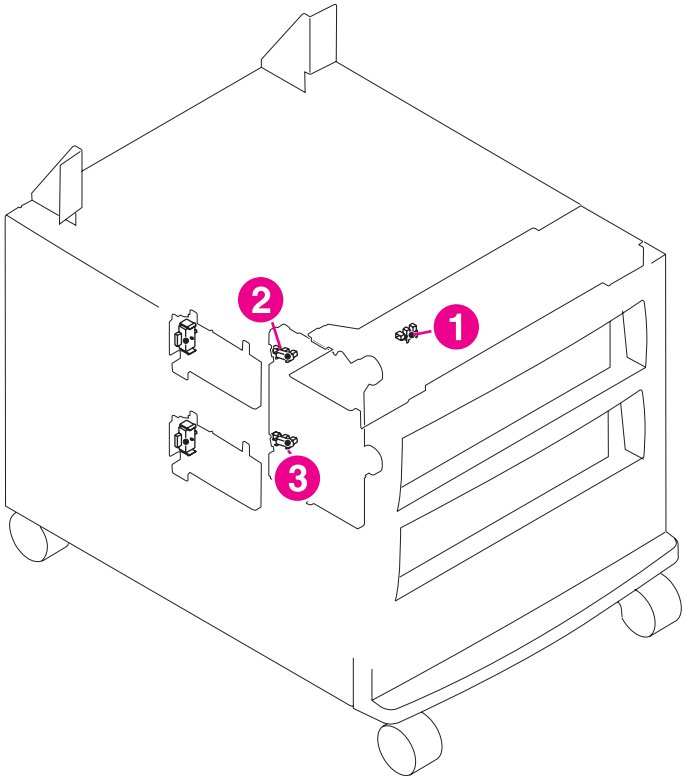


Figure 7-23 Sensors (2 x 500-sheet feeder, HP CLJ 4650 models only)

1	Feed sensor (SR3)
2	Upper cassette paper sensor (SR1)
3	Lower cassette paper sensor (SR2)

Component test (special mode test)

Use the component test to exercise individual parts independently to isolate problems.

Each component test can be performed once or repeatedly. If **CONTINUOUS** is selected as the repeat option, the test will cycle the component on and off. This process continues for 2 minutes, and then the test terminates.

NOTE The door interlock switch must be defeated to run any of the component tests. If covers are removed, the door switch must be manually cycled during some tests in order for the engine to recognize a change. The ETB assembly can be open, closed, or removed while some of these tests are executing. Print cartridges can be installed or removed during certain tests. The control-panel display prompts for removal of some or all cartridges during certain tests in order to rotate and isolate certain components, as well as to protect the cartridges and ETB.

1. Press (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models) to open the **MENUS**.
2. Press to highlight **DIAGNOSTICS**.
3. Press to select **DIAGNOSTICS**.
4. Press to highlight **COMPONENT TEST**.
5. Press to select **COMPONENT TEST**.
6. Select the component test options when prompted by the printer.

Menus cannot be opened during component tests, so (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models) serves the same function as CANCEL JOB (HP Color LaserJet 4600 models) or STOP (HP Color LaserJet 4610n and 4650 models).

The following component tests can be performed:

- **Transfer motors**. This test turns the components that are involved in the image transfer process: the cartridge motors, the ETB motor and belt (if the ETB is closed and the connector is seated), and the print cartridges (if the ETB is closed). You can remove or install print cartridges during this test.
- **Belt only**. This test turns only the ETB motor and belt. The ETB must be closed and the connector seated. The control-panel display prompts you to remove the cartridges because the ETB belt contacts the photosensitive drums and cannot turn without them rotating also. Rotating the photosensitive drums could damage the belt or photosensitive drums. If covers are removed, you must manually activate the door switch after removing the cartridges in order for the test run.
- **Cartridge motors**. This test rotates only the print-cartridge drive motors. The control-panel display prompts you to remove at least one cartridge because the ETB belt contacts the photosensitive drums and cannot turn without them rotating also. The engine rotates the cartridge motor(s) for only the cartridges that are removed. To rotate all motors sequentially, remove all of the cartridges; to isolate one motor, remove only that cartridge. If covers are removed, you must manually activate the door switch after removing the cartridges in order to perform the test. Always start this test with all of the cartridges installed, and activate the door switch so that the printer recognizes the configuration. Then you can proceed with the test, by removing one or more cartridges.

- **Black, Magenta, Yellow, Cyan laser/scanners**. Use the following four tests to rotate each scanner motor individually.
- **Fuser motor**. Use this test to rotate the fuser motor and drive gears.
- **Alienation motor** (also called the developing disengaging motor). This test moves the developing disengaging rod, clutches, and plates through their three positions:
  - **Clean/Home**: Middle position; all cartridges disengaged; used during cleaning cycle
  - **Color**: Top position; no cartridges disengaged; used during color printing
  - **Black**: Lowest position; C, M, and Y cartridges disengaged, black engaged; used during black-only printing
- **Tray1/tray 2 solenoids**. This test activates and releases the tray 1 and tray 2 solenoids. The tray 1 solenoid is the lower solenoid. The tray 2 solenoid is the upper solenoid. You can remove the two securing screws and rotate the paper pickup unit to get a better view of the solenoids.

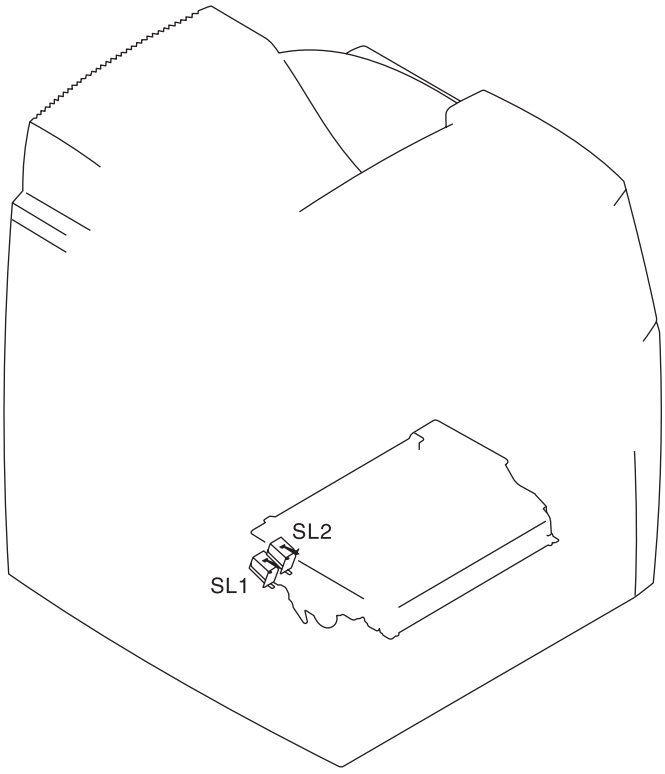


Figure 7-24 Location of solenoids

Table 7-52 Solenoids

Name	Function
SL1	Cassette pickup solenoid (paper pickup drive assembly)
SL2	Multi-purpose tray pickup solenoid (paper pickup drive assembly)

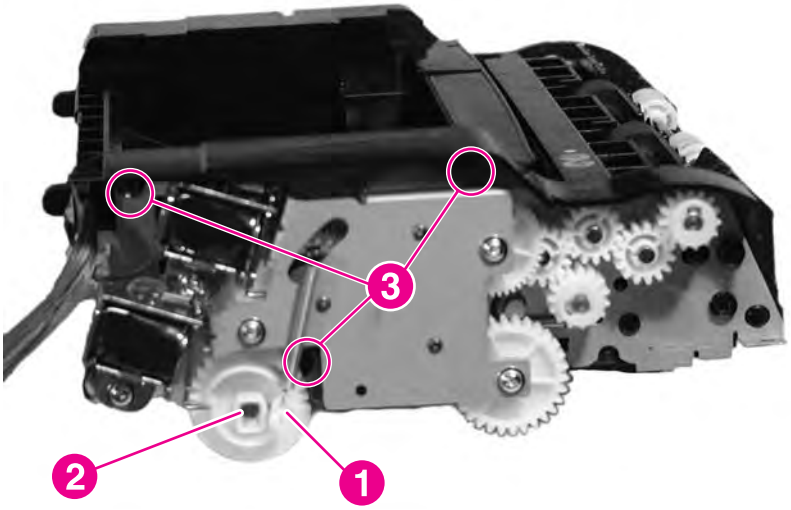


Figure 7-25 Solenoids on the paper pickup unit

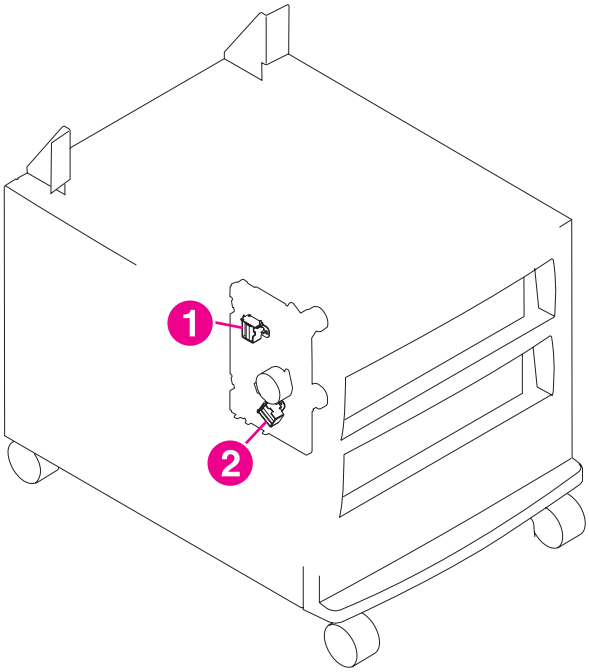


Figure 7-26 Solenoids (2 x 500-sheet feeder, HP CLJ 4650 models only)

1	Upper cassette pickup solenoid (SL1)
2	Lower cassette pickup solenoid (SL2)

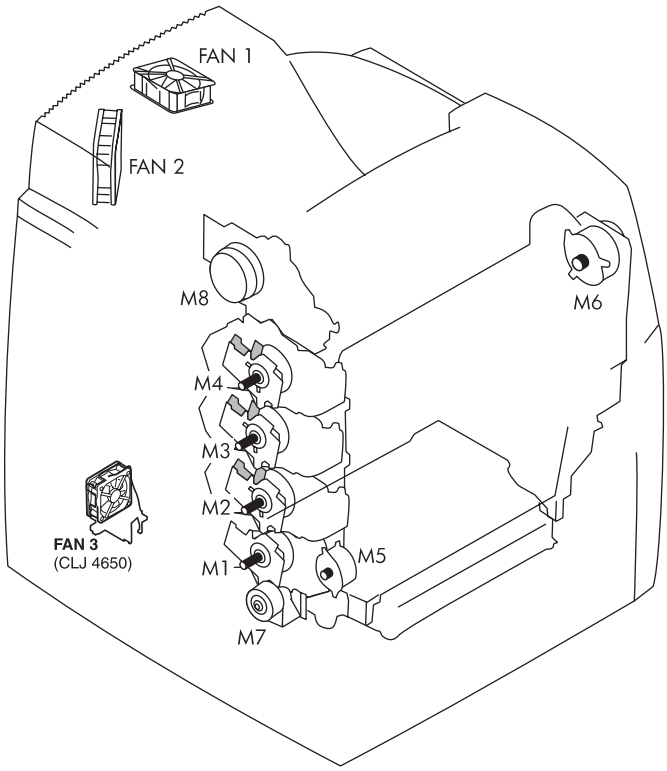


Figure 7-27 Location of motors and fans

Table 7-53 Motors and fans

Name	Function
M1	Cyan drum motor
M2	Yellow drum motor
M3	Magenta drum motor
M4	Black drum motor
M5	Paper pickup motor
M6	ETB motor
M7	Developing disengaging motor
M8	Fuser motor
FAN1	Formatter fan
FAN2	Cartridge fan
FAN3	Power-supply fan (HP Color LaserJet 4610n and 4650 models)

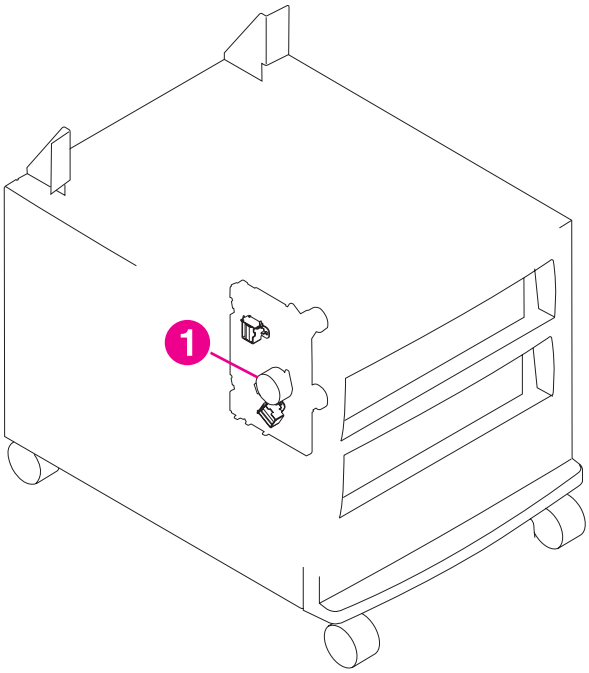


Figure 7-28 Motor (2 x 500-sheet feeder, HP CLJ 4650 models only)

1	2 x 500-sheet paper feeder motor (M1)

Print/Stop test

Use this diagnostic test to isolate the cause of problems such as image-formation defects and jams within the engine. During this test you can stop the paper anywhere along the printer-paper path. The test can be programmed to stop printing internal pages or an external print job when the paper reaches a certain position. The test can also be programmed to stop from 0 to 60,000 mS. If the timer is set to a value that is greater than the job-print time, you can recover the printer in one of two ways.

- After the print job is completes press CANCEL JOB (HP Color LaserJet 4600 models) or STOP (HP Color LaserJet 4610n and 4650 models) to return to the **Diagnostic** menu before the timer times out.
- After the timer times out, press CANCEL JOB (HP Color LaserJet 4600 models) or STOP (HP Color LaserJet 4610n and 4650 models). Activate the door switch to restart the engine and return it to a normal state.

When the timer is activated, the control-panel display shows the message **Printing stopped Press ✓ to continue**. Pressing ✓ (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models) prints the previously selected job. If you do not want the previous job to print, press CANCEL JOB (HP Color LaserJet 4600 models) or STOP (HP Color LaserJet 4610n and 4650 models) first, and then press ✓ (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models).

NOTE Do not attempt to perform a **Print/Stop** test while the printer is calibrating, because you be required to power-cycle the printer. If a jam message appears on the control-panel display during testing, activate the door switch.

Information menu

From the **Information** menu, the following pages can be printed.

Print Menu Map. Use this item to print the control-panel menu map, which shows the layout and current settings of the control-panel menu items.

Print Configuration. Use this item to help troubleshoot printer problems or to verify installation of optional accessories (such as memory DIMMs for the HP Color LaserJet 4600 models and DDRs for the HP Color LaserJet 4650 models), trays, and printer languages.

Print Supplies Status Page. Use this item to print a page that shows the remaining life of the supplies.

Supplies Status. Use this item to view a page that shows the supplies status in a searchable list on the control-panel display.

Print Usage Page. Use this item to print a page that shows a count of all media sizes that have passed through the printer and lists whether they were simplex, duplex, monochrome, or color; and reports page count.

Print Demo. Use this item to print a demonstration page.

Print RGB Samples. Use this item to print color samples for different RGB values (HP Color LaserJet 4610n and 4650 models).

Print CMYK Samples. Use this item to print color samples for different CMYK values (HP Color LaserJet 4610n and 4650 models).

Print File Directory. Use this item to print a page that shows the name and directory of files that are stored in the printer on an optional hard disk.

Print PCL Font List. Use this item to print a page that shows the available PCL fonts.

Print PS Font List. Use this item to print a page that shows the available PS (emulated PostScript) fonts.

Configure device menu/printing menu

Print PS Errors. Use this item to print PS error pages.

Print PDF Errors. Use this item to print PDF error pages.

Configure device menu/resets menu

Reset Factory Settings. Use this item to clear the page buffer, remove all perishable personality data, reset the printing environment, and return all default settings to factory defaults.

Powersave. Use this item to reset PowerSave mode to the factory default 30-minute setting.

Reset Supplies. Use this item to inform the printer that a new transfer kit or new fuser kit has been installed. This item also resets the page count of that supply to zero.

Configure device menu/print quality menu

Adjust color. Use this item to modify halftone settings for each color.

Set Registration. Use this item to align simplex and duplex images.

Print Modes. Use this item to associate each media type with a specific print mode.

Optimize. Use this item to optimize certain parameters for all jobs rather than optimizing by media type.

Calibrate Now. For HP Color LaserJet 4600 models, use this item to calibrate the printer for optimum print quality.

Full Calibrate Now. For HP Color LaserJet 4610n and 4650 models, use this item to calibrate the printer for optimum print quality.

Quick Calibrate Now. For HP Color LaserJet 4610n and 4650 models, use this item to partially calibrate the printer for optimum print quality.

Color Ret. Use this item to turn on or turn off a color printer Resolution Enhancement technology (REt) setting.

Test pages

Printing test pages helps you determine whether the printer engine and the formatter are functioning.

Engine test page

To verify that the printer engine is functioning, print an engine test page. Use a small pointed object to depress the test page switch located on the left side of the printer, as shown in Figure 7-29 Test page switch. The test page should have a series of horizontal lines. The test page can use only tray 2 as the paper source, so make sure that paper is loaded in tray 2.

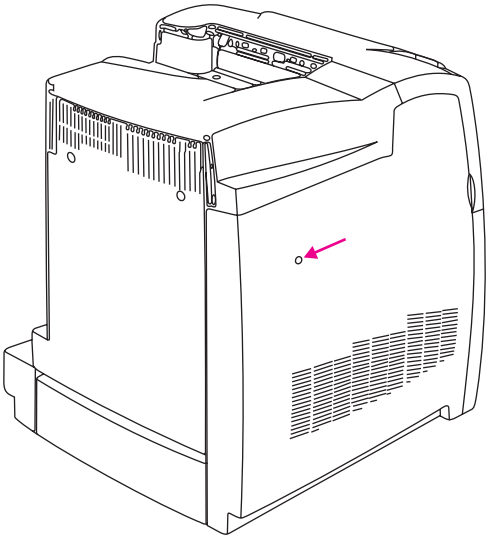


Figure 7-29 Test page switch

Formatter test page

To verify that the formatter is functioning, print a configuration page as follows:

1. Press (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models) to open the **MENUS**.
2. Press to highlight **INFORMATION**.
3. Press to select **INFORMATION**.
4. Press to highlight **PRINT CONFIGURATION**.
5. Press to select **PRINT CONFIGURATION**.

Engine resets

Use the following procedures when you perform engine resets.

Cold reset

A cold reset unlocks menus that have been locked and resets control-panel variables. However, it does not clear the values in the **Service** menu (such as the serial number and page counts).

WARNING! Performing a cold reset erases all of the EIO card information.

To perform a cold reset

1. Turn the printer on.
2. As the printer performs its power-on sequence, press and hold ✓ (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models) until all three lights on the control panel are lit.
3. When **SELECT LANGUAGE** appears on the control-panel display, press ▲ until **COLD RESET** appears on the control-panel display.
4. Press ✓ (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models). The printer performs a cold reset and then continues its power-on sequence.

NVRAM initialization

CAUTION Initializing NVRAM resets the serial number, the event log, the page counts, the calibration settings, and the EIO card. Use the **Service** menu to restore the serial number and page counts. You also need to reconfigure any computers that print to this printer to recognize the printer. Initialize NVRAM only when absolutely necessary. In most situations, use a cold reset to reset printer variables but still retain the needed values in the **Service** menu.

Before initializing NVRAM, print a configuration page and a supplies status page to gather the following information:

NOTE NVRAM initialization does not always clear all color plane registration (CPR) problems. If after an NVRAM initialization, CPR problems persist, see Resetting the calibration values for the DC controller.

- Total page count and color page count
- Transfer kit count
- Fuser kit count
- Serial number

To initialize NVRAM

1. Turn the printer on and watch the control-panel display.
2. When the display shows the memory count, press and hold ▼ until all three lights on the control panel are lit.
3. Press ▲.
4. Press PAUSE/RESUME (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models). The message **SKIP DISK LOAD** appears on the control-panel display.
5. Press ▲ until **NVRAM INIT** is highlighted.
6. Press✓ The printer initializes NVRAM and then continues its power-on sequence.

Resetting the calibration values for the DC controller

Performing an NVRAM initialization clears the calibration values from the formatter, but it does not clear the calibration values from the DC controller. If problems with color-plane registration persist after performing an NVRAM initialization, you should reset the calibration values for the DC controller.

To reset the calibration values for the DC controller

1. Open the top cover.
2. Press and hold the engine test switch on the left side of the printer for several seconds.
3. Close the top cover, and observe the control-panel display. If the message **Performing Calibration** appears, the reset was successful.

Hard disk initialization

A hard disk initialization will erase and reformat the printer's hard disk. Perform hard disk initialization only if an error code appears on the control panel indicating an EIO disk error. Always try initializing the hard disk before replacing it.

To initialize the hard disk

1. Turn the printer on.
2. As the printer performs its power-on sequence, press and hold the PAUSE/RESUME (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models) button until all three lights on the control panel are lit.
3. Press ◀. The message **INITIALIZE DISK** appears on the control-panel display.
4. Press ✓ The printer initializes the hard disk and continues its power-on sequence.

Calibration bypass

During certain diagnostic procedures, you need to bypass the automatic calibration that is performed whenever the printer is turned on.

To bypass calibration

1. Turn the printer on and watch the control-panel display.
2. When the display shows the memory count, press and hold ▼ until all three lights on the control panel are lit.
3. Press ▲.
4. Press PAUSE/RESUME (HP Color LaserJet 4600 printer) or MENU (HP Color LaserJet 4610n and 4650 models). The message **SKIP DISK LOAD** appears on the control-panel display.
5. Press ▲ until **SKIP CALIBRATION** is highlighted.
6. Press ✓. The printer skips calibration and then continues its power-on sequence.

Calibrate Now (HP Color LaserJet 4600 models)

Use the following procedure to calibrate the printer whenever you replace the DC controller, the ETB, the drum drive motors, the drum drive gears, or a laser/scanner.

1. Press ✓ to open the **MENUS**.
2. Press ▼ to highlight **CONFIGURE DEVICE**.
3. Press ✓ to select **CONFIGURE DEVICE**.
4. Press ▼ to highlight **PRINT QUALITY**.
5. Press ✓ to select **PRINT QUALITY**.
6. Press ▼ to highlight **CALIBRATE NOW**.
7. Press ✓ to select **CALIBRATE NOW**. Wait for the printer to calibrate.

Quick Calibrate Now (HP Color LaserJet 4610n and 4650 models)

Quick Calibrate Now is used for color tone calibration (D-Max and D-Half) and takes about 68 seconds.

1. Press MENU to open the **MENUS**.
2. Press ▼ to highlight **CONFIGURE DEVICE**.
3. Press ✓ to select **CONFIGURE DEVICE**.
4. Press ▼ to highlight **PRINT QUALITY**.
5. Press ✓ to select **PRINT QUALITY**.
6. Press ▼ to highlight **QUICK CALIBRATE NOW**.
7. Press ✓ to select **QUICK CALIBRATE NOW**. Wait for the printer to calibrate.

Full Calibrate Now (HP Color LaserJet 4610n and 4650 models)

Use the following procedure to calibrate the printer whenever you replace the DC controller, the ETB, the drum drive motors, the drum drive gears, or a laser/scanner. Full Calibrate Now includes the Quick Calibrate routines and adds Drum Phase Calibration and Color Plane Registration. Full Calibrate lasts for about 3 minutes and 15 seconds.

1. Press MENU to open the **MENUS**.
2. Press ▽ to highlight **CONFIGURE DEVICE**.
3. Press ✓ to select **CONFIGURE DEVICE**.
4. Press ▽ to highlight **PRINT QUALITY**.
5. Press ✓ to select **PRINT QUALITY**.
6. Press ▽ to highlight **FULL CALIBRATE NOW**.
7. Press ✓ to select **FULL CALIBRATE NOW**. Wait for the printer to calibrate.

Service menu

The following sections describe the **Service** menu.

Using the Service menu

The **Service** menu is PIN protected for added security. Only authorized service people have access to the Service menu. When you select SERVICE from the list of menus, you are prompted to type an eight-digit PIN number. The PIN for the HP Color LaserJet 4600 models is 04460002. The PIN for the HP Color LaserJet 4610n and 4650 models is 05465004.

1. Press (HP Color LaserJet 4600 models) or MENU (HP Color LaserJet 4610n and 4650 models) to open the **MENUS**.
2. Press to highlight **SERVICE**.
3. Press to select **SERVICE**.
4. Press or until the first digit of the PIN appears.
5. Press to save the digit. The control-panel display replaces the digit with an asterisk.

   Press at any time to move to the previous digit.
6. Repeat steps 4 and 5 until all eight digits are typed.

Clear event log

Use this item to clear the printer internal event log.

Total page count

The page count that is stored in NVRAM and printed on the configuration page represents the number of pages that the formatter has formatted (not including engine-test prints). If you install a new formatter when repairing a printer, use this menu item to reset the page count to the previous value. In this way, the page count reflects the number of pages that the engine has printed rather than restarting the count for the new formatter. The page count is in two categories: total mono pages and total color pages.

Transfer kit count

Use this item to reset the transfer unit count if the value is lost, such as when you replace the formatter. This value is initially set to zero at the factory. Type a value up to 120,000. This value is automatically reset to zero when a customer installs a new transfer kit and sets **NEW TRANSFER KIT** to **YES** in the **Resets** menu.

Fuser kit count

Use this item to reset the fuser count if the value is lost, such as when you replace the formatter. This value is initially set to zero at the factory. Type a value up to 150,000. This value is automatically reset to zero when a customer installs a new transfer kit and sets **NEW FUSER KIT** to **YES** in the **Resets** menu.

Serial number

If you replace the formatter, use this item to reset the serial number of the printer.

Service ID

Use this item to make the date that the printer was first used appear on the control panel. This eliminates the need for users to keep paper receipts for proof of warranty. Because the printer does not have an internal clock, the service ID date availability is dependent on the printer being connected to a source that can provide the date, such as the installer, the driver, or the embedded Web server. If the printer is not connected to a date source, then the service ID will not be available and **000000** will appear on the control-panel display.

The following sections describe how to restore a service ID from a known date and how to convert a date to a service ID. The examples in each section use a known date of September 22, 2004, and a service ID = 14262.

Restoring the Service ID

If you replace the formatter, the date is lost. Use this menu item to reset the date to the original date that the printer was first used. The date format is YYDDD. Use the following procedure to calculate the dates:

1. To calculate YY, subtract 1990 from the calendar year.
2. To calculate DDD, use the following formula:

   30*(calendar month – 1) + calendar day = DDD

NOTE If the calendar day = 31, use 30 instead.

Example (actual date is September 22, 2004)

1 2004 – 1990 = 14

14 = YY

2 30*(9–1) + 22 = DDD

30*(8) + 22 = DDD

240 + 22 = DDD

262 = DDD

3 Service ID = YYDDD

Service ID = 14262

Converting the Service ID to an actual date

You can use the printer Service ID number to determine whether the printer is still under warranty. Use the following procedure to convert the Service ID into the installation date:

1. Add 1990 to YY to determine the actual year that the printer was installed.
2. Divide DDD by 30. If there is a remainder, add 1 to the result. This is the month.
3. The remainder from the calculation in step 2 is the day of the month. If there is no remainder, the day of the month is 30.

Example (service ID is 14262)

1 1990 + 14 = 2004

2 262 ÷ 30 = 8 with a remainder of 22.

8 + 1 = 9

Month = 9 (September)

3 22 = Day of month

4 Actual date = September 22, 2004

NOTE A 6-day grace period is built into the date system.

Cold reset paper

When you perform a cold reset, the paper size that is stored in NVRAM is reset to the default factory setting. If you replace a formatter board in a country/region that uses A4 as the standard paper size, use this menu to reset the default paper size to A4. LETTER and A4 are the only available values.

Diagrams

Main parts

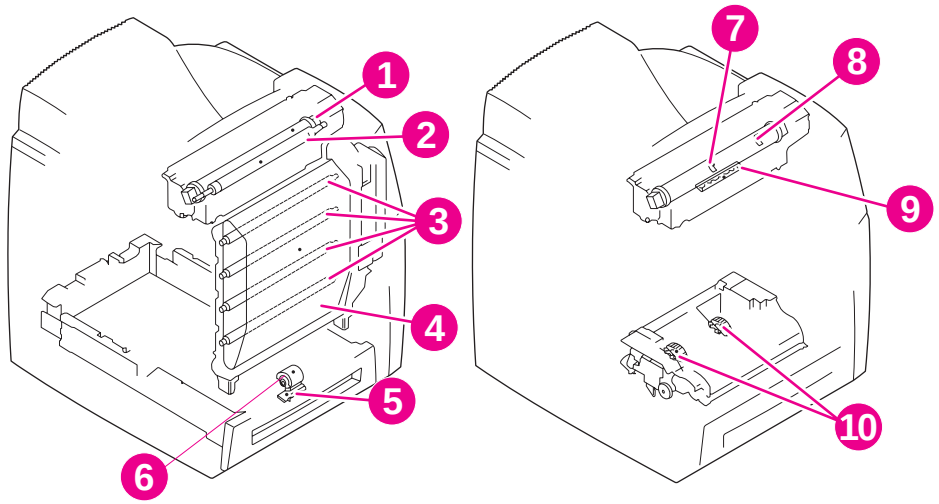


Figure 7-30 Location of main parts

1	Fuser sleeve
2	Pressure roller
3	Transfer charging rollers
4	ETB belt
5	Separation pad
6	Multipurpose tray pickup roller
7	Main thermistor
8	Sub thermistor
9	Thermoswitch
10	Cassette pickup rollers

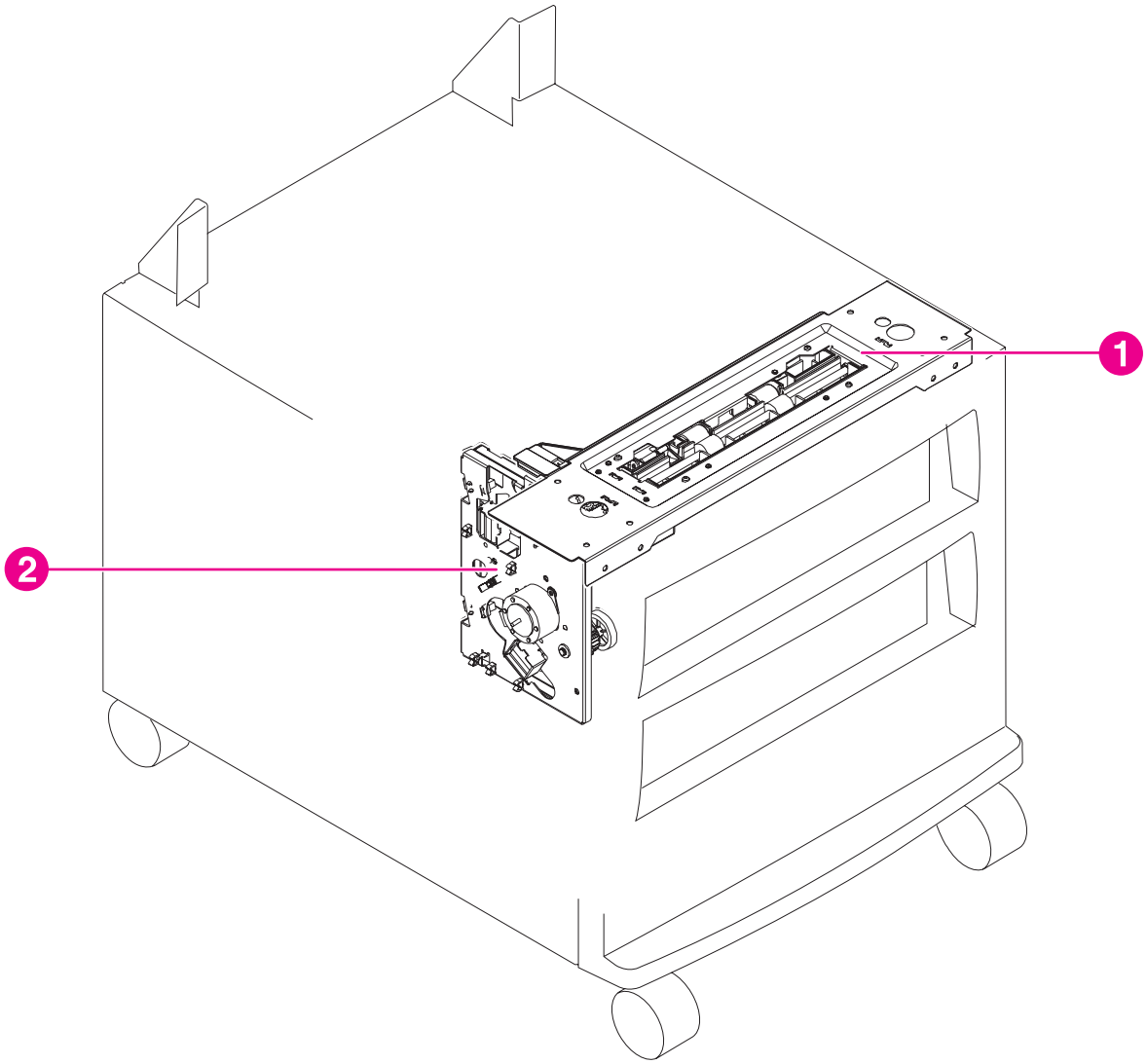


Figure 7-31 Main parts (2 x 500-sheet feeder, HP CLJ 4650 models only)

1	Upper-cassette pickup assembly
2	Drive assembly

Switches

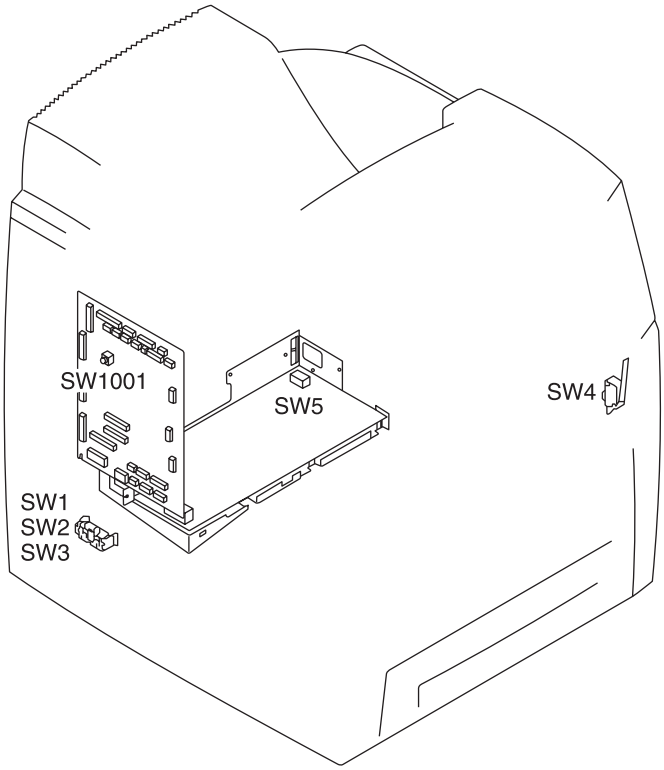


Figure 7-32 Location of switches

Table 7-54 Switches

Name	Function
SW1	Cassette paper-size detection switch
SW2	Cassette paper-size detection switch
SW3	Cassette paper-size detection switch
SW4	Door switch
SW5	On/off switch
SW1001	Test-print switch

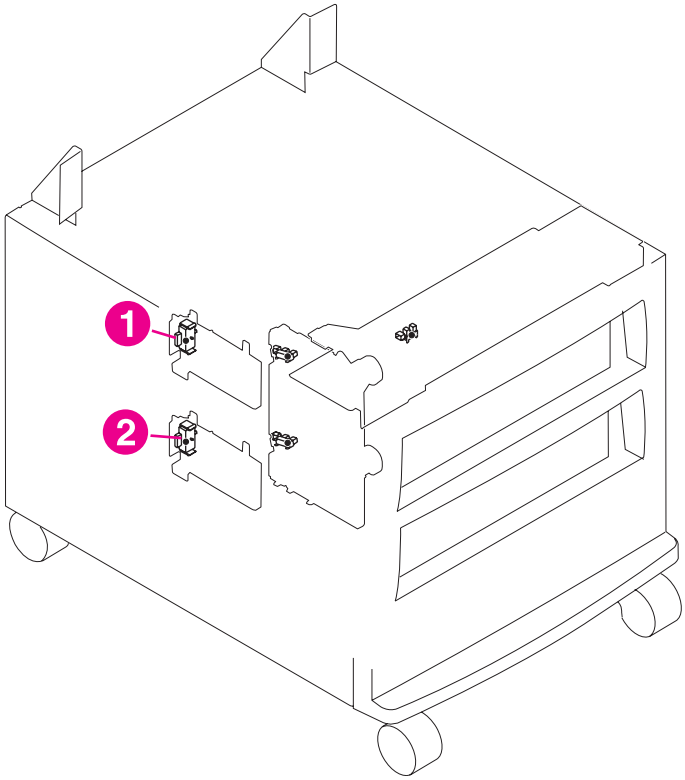


Figure 7-33 Switches (2 x 500-sheet feeder, HP CLJ 4650 models only)

1	Upper-cassette paper-size detection switch (SW1)
2	Lower-cassette paper-size detection switch (SW2)

Sensors

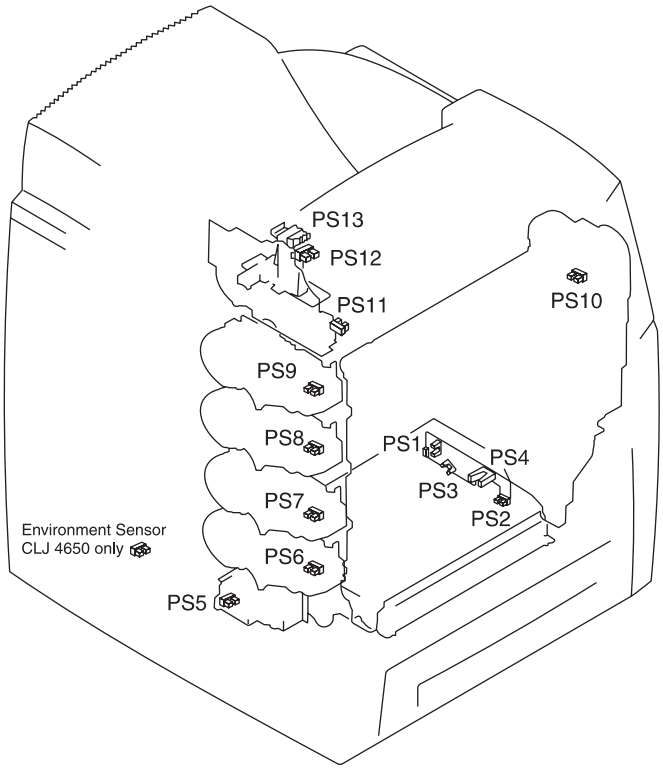


Figure 7-34 Location of sensors

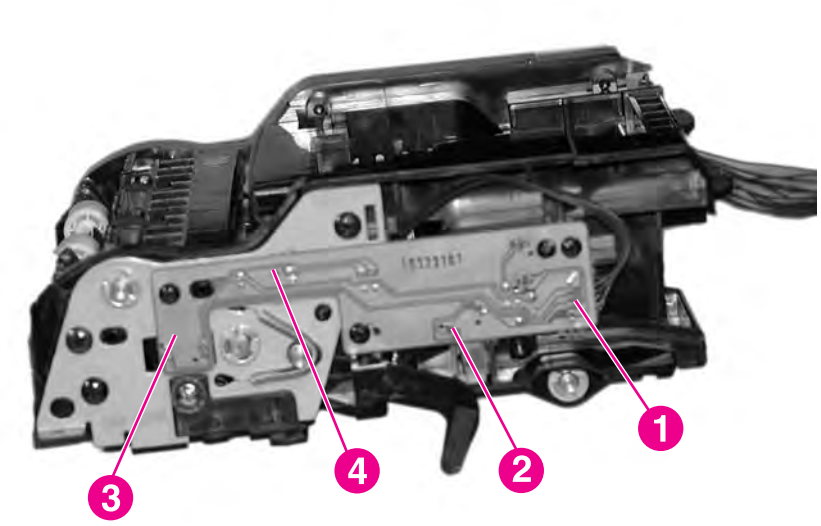


Figure 7-35 Sensors on the paper pickup unit (sensors are on the back of the PCA)

1	Cassette paper sensor (PS1)
2	Multipurpose-tray paper sensor (PS2)
3	Paper leading-edge sensor (PS3)
4	Overhead transparency sensor (PS4)

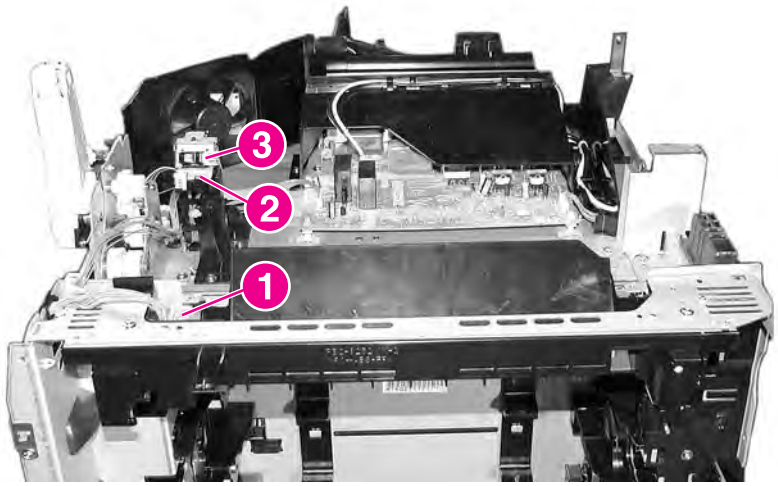


Figure 7-36 Fuser sensors and output bin full sensor

1	Fuser inlet paper sensor (PS11)
2	Fuser delivery sensor (PS12)
3	Output-bin-full sensor (PS13)

Table 7-55 Sensors

Name	Function
PS1	Cassette paper-present sensor
PS2	Multipurpose tray paper-present sensor
PS3	Paper leading-edge sensor
PS4	Overhead transparency sensor
PS5	Developing disengagement sensor
PS6	Cyan drum home-position sensor
PS7	Yellow drum home-position sensor
PS8	Magenta drum home-position sensor
PS9	Black drum home-position sensor
PS10	ETB speed sensor
PS11	Fuser inlet paper sensor
PS12	Fuser delivery sensor
PS13	Output-bin-paper-full sensor

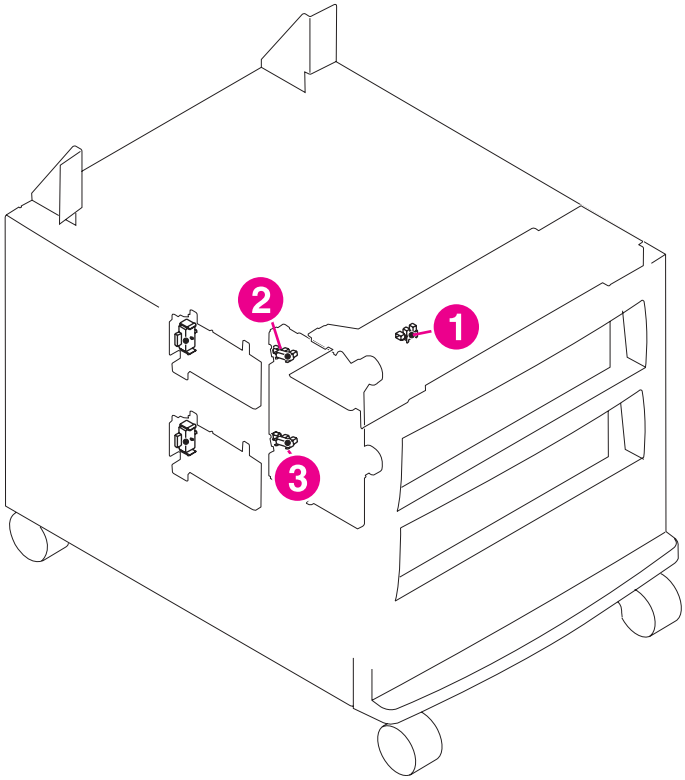


Figure 7-37 Sensors (2 x 500-sheet feeder, HP CLJ 4650 models only)

1	Feed sensor (SR3)
2	Upper-cassette paper sensor (SR1)
3	Lower-cassette paper sensor (SR2)

Solenoids

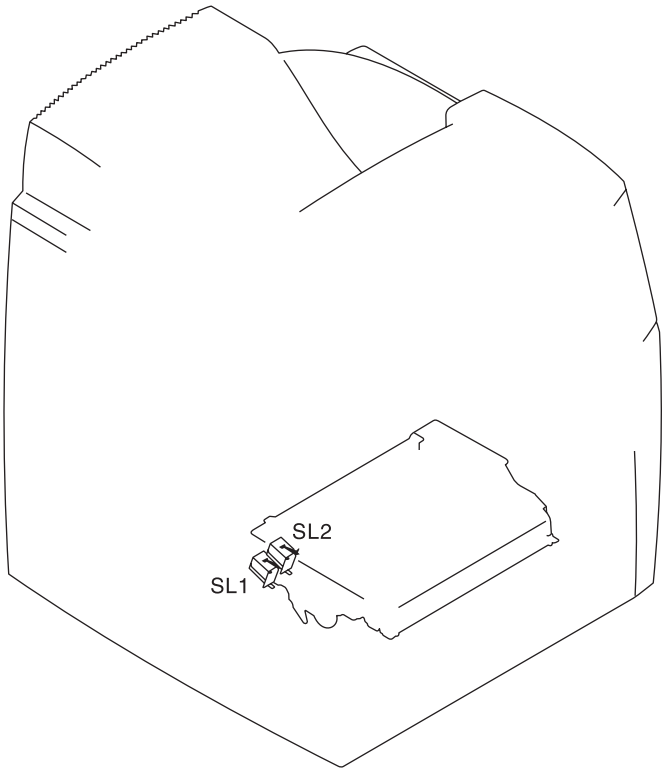


Figure 7-38 Location of solenoids

Table 7-56 Solenoids

Name	Function
SL1	Cassette pickup solenoid (paper-pickup-drive assembly)
SL2	Multipurpose-tray pickup solenoid (paper-pickup-drive assembly)

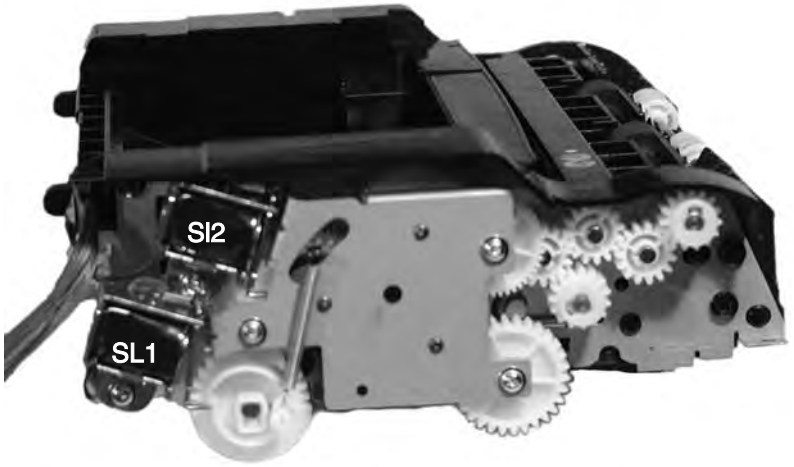


Figure 7-39 Solenoids on the paper pickup unit

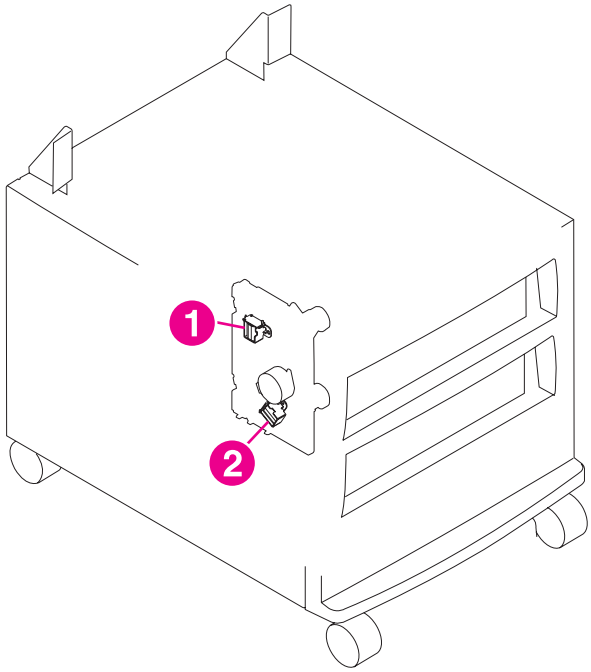


Figure 7-40 Solenoids (2 x 500-sheet feeder, HP CLJ 4650 models only)

1	Upper-cassette pickup solenoid (SL1)
2	Lower-cassette pickup solenoid (SL2)

Motors and fans

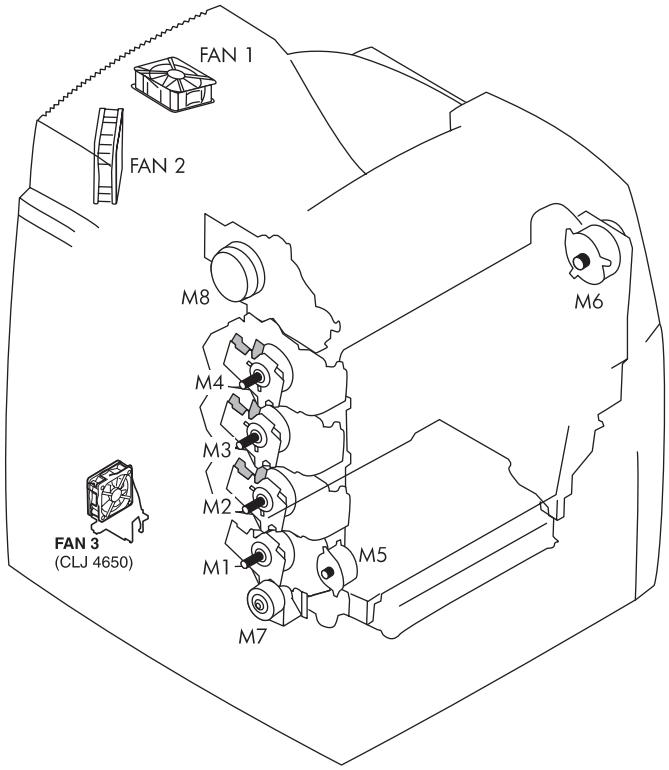


Figure 7-41 Location of motors and fans

Table 7-57 Motors and fans

Name	Function
M1	Cyan drum motor
M2	Yellow drum motor
M3	Magenta drum motor
M4	Black drum motor
M5	Paper pickup motor
M6	ETB motor
M7	Developing disengaging motor
M8	Fuser motor
FAN1	Formatter fan
FAN2	Cartridge fan
FAN3	Power-supply fan (HP Color LaserJet 4610n and 4650 models only)

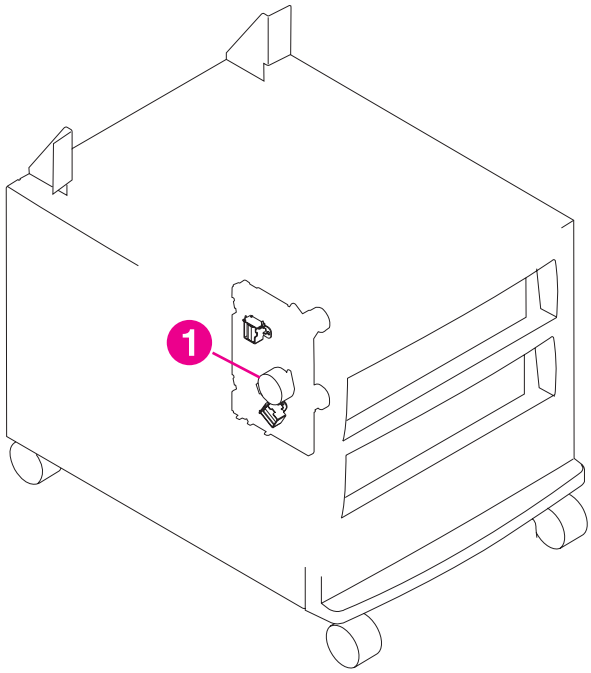


Figure 7-42 Motor (2 x 500-sheet feeder, HP CLJ 4650 models only)

1	2 x 500-sheet paper-feeder motor (M1)

PCAs

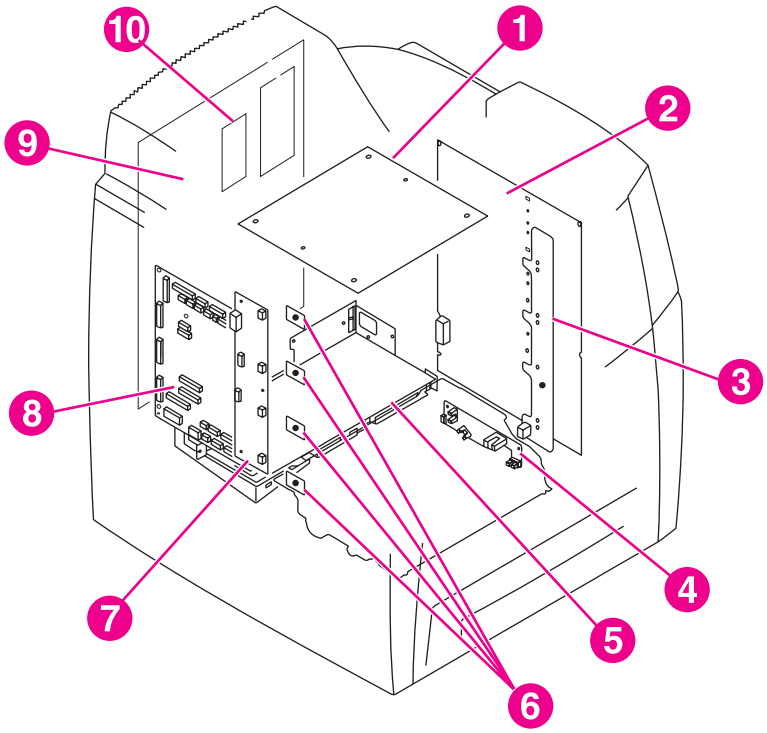


Figure 7-43 PCA locations

1	Fuser power-supply PCA
2	High-voltage power-supply PCA
3	Toner-level-detection PCA
4	Paper pickup sensor PCA
5	Low-voltage power-supply PCA
6	Antenna PCAs
7	Memory controller PCA
8	DC controller PCA
9	Formatter PCA
10	Firmware DIMM PCA (HP CLJ 4600) CompactFlash (HP CLJ 4610n and 4650 models only)

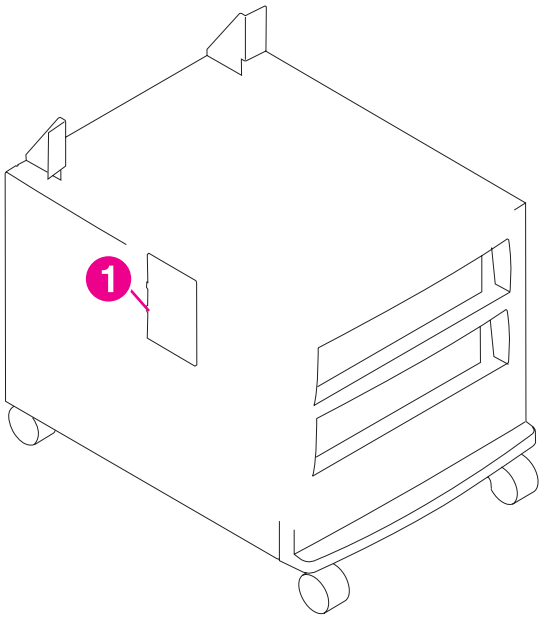


Figure 7-44 PCA (2 x 500-sheet feeder, HP CLJ 4650 models only)

1	2 x 500-sheet paper-feeder PCA

DC controller PCA

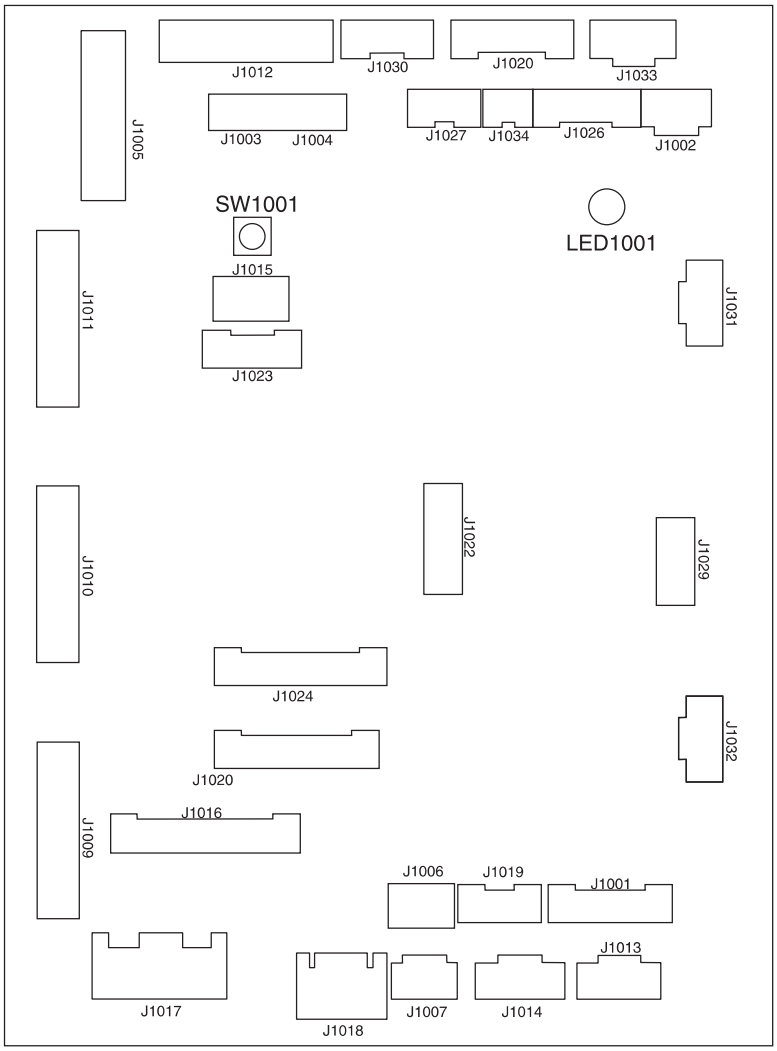


Figure 7-45 Location of DC controller PCA components (HP Color LaserJet 4600 models)

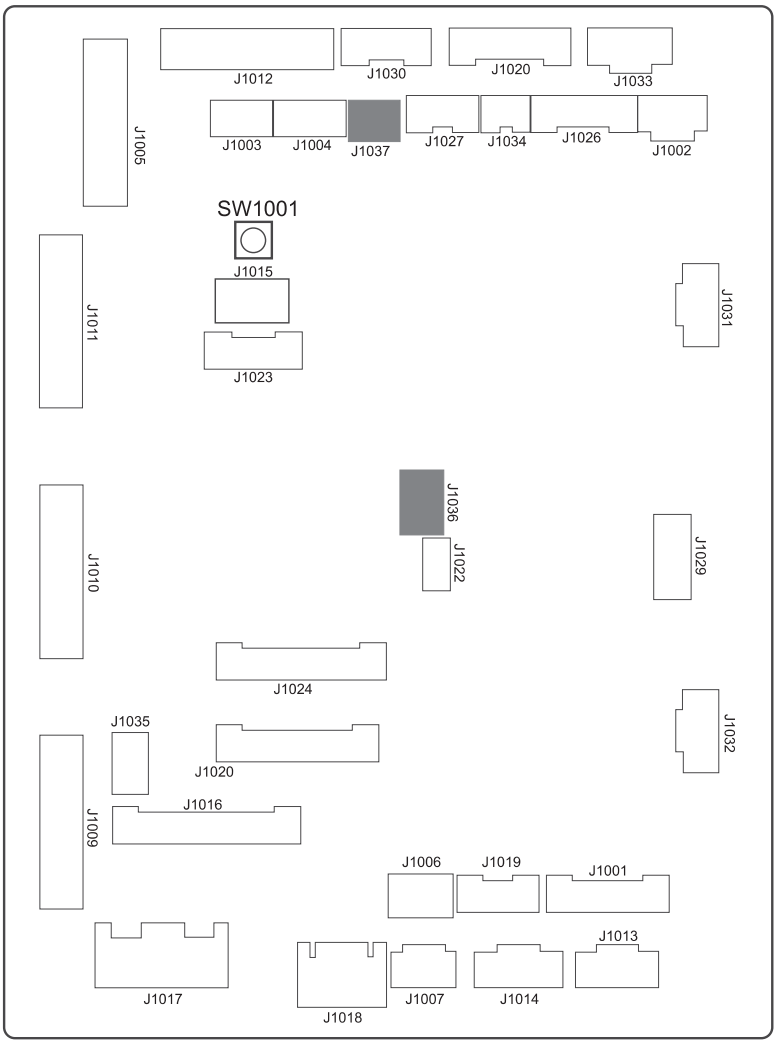


Figure 7-46 Location of DC controller PCA components (HP Color LaserJet 4610n and 4650 models)

Connectors

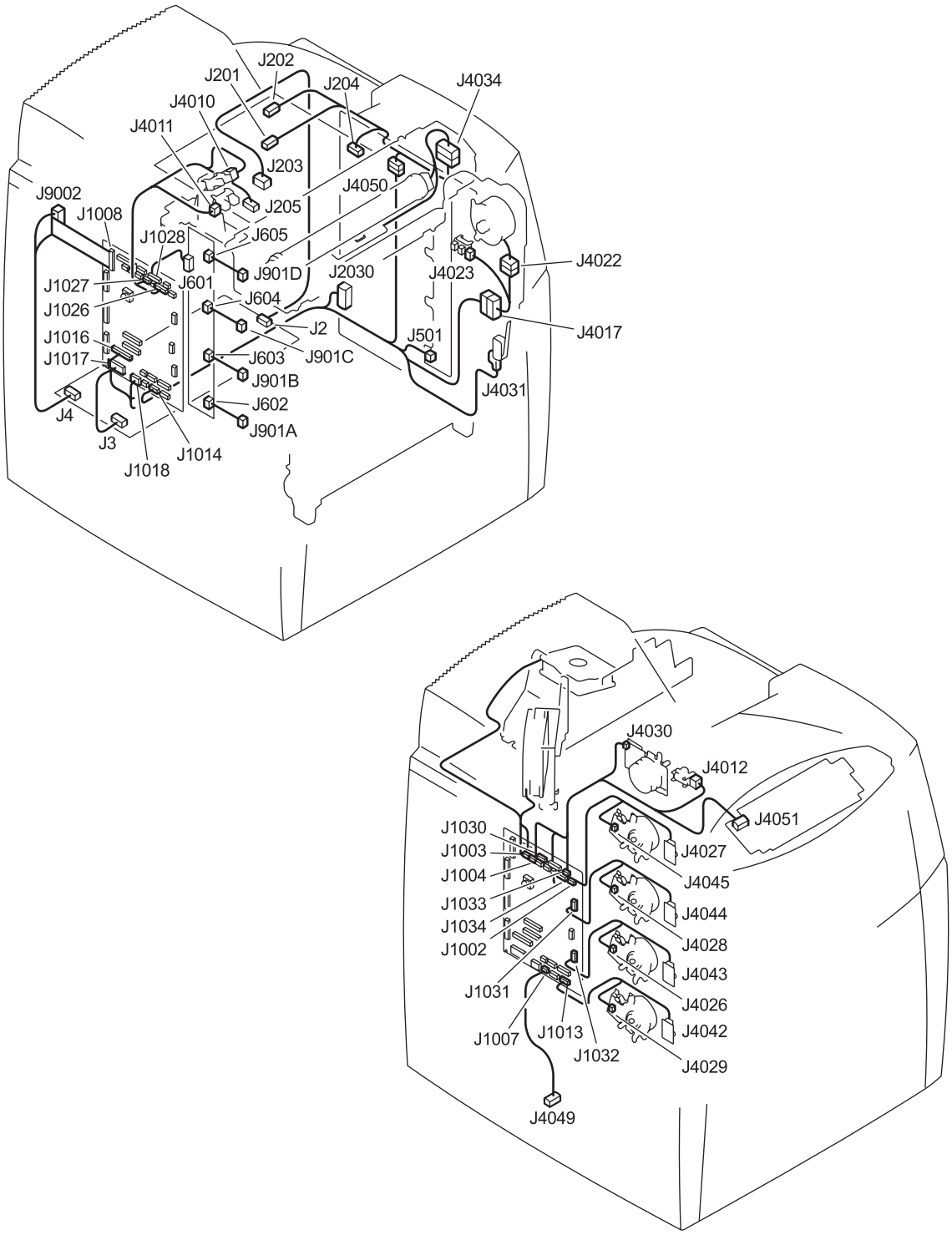


Figure 7-47 Location of connectors (HP Color LaserJet 4600 models)

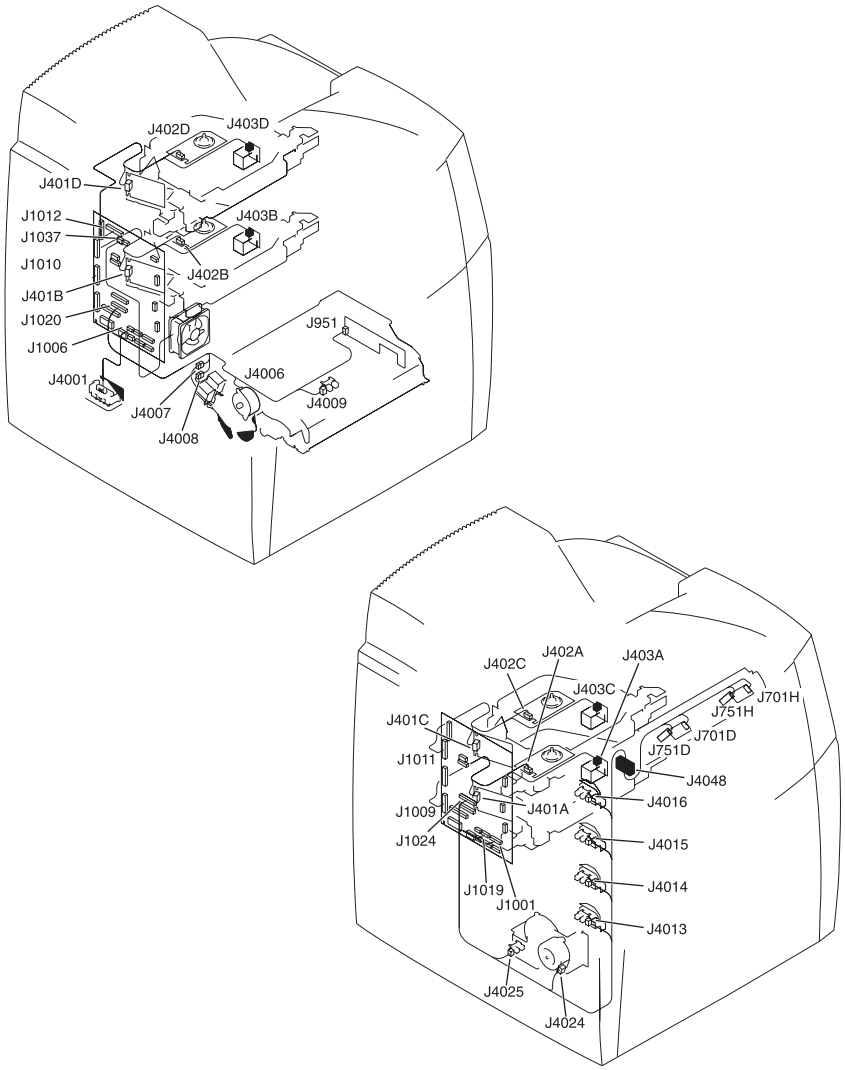


Figure 7-48 Location of connectors (1 of 2); HP Color LaserJet 4610n and 4650 models)

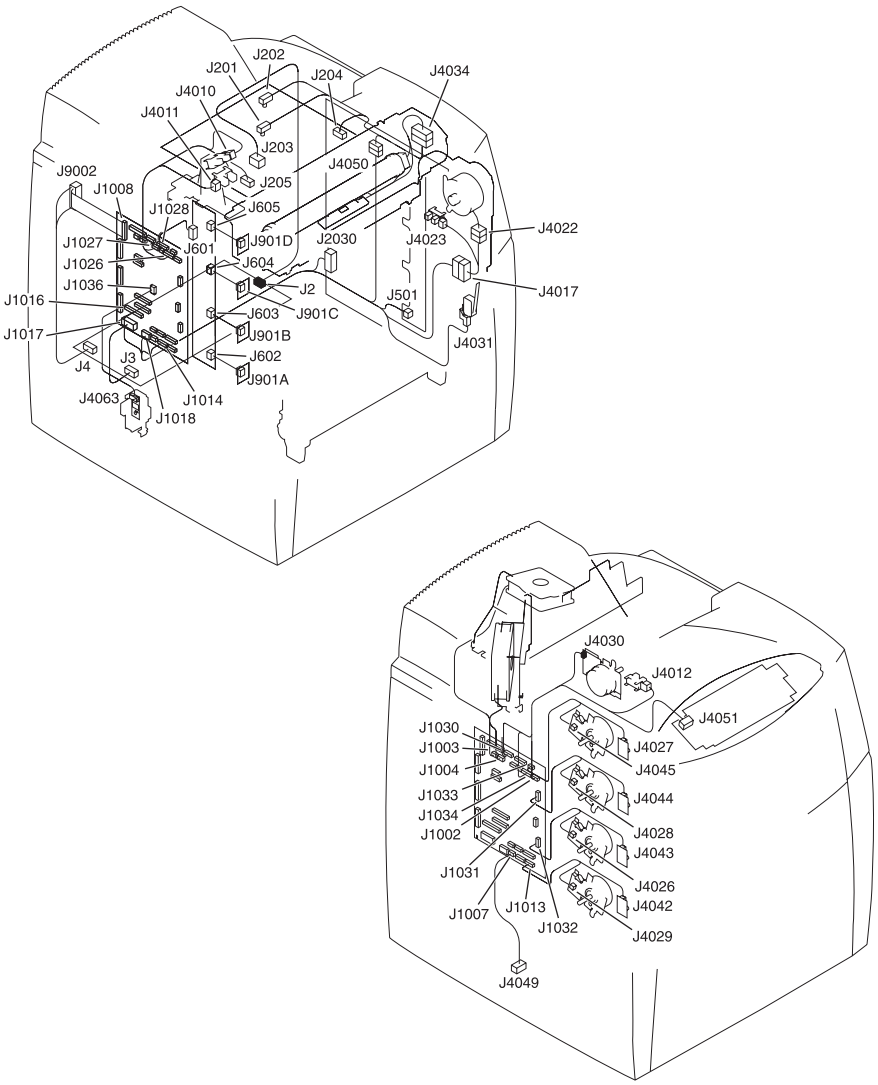


Figure 7-49 Location of connectors (2 of 2); HP Color LaserJet 4610n and 4650 models)

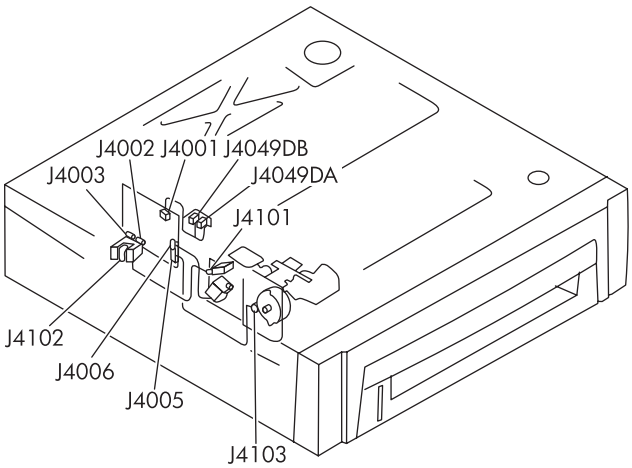


Figure 7-50 Connectors (500-sheet feeder, HP CLJ 4600 and 4650 models only)

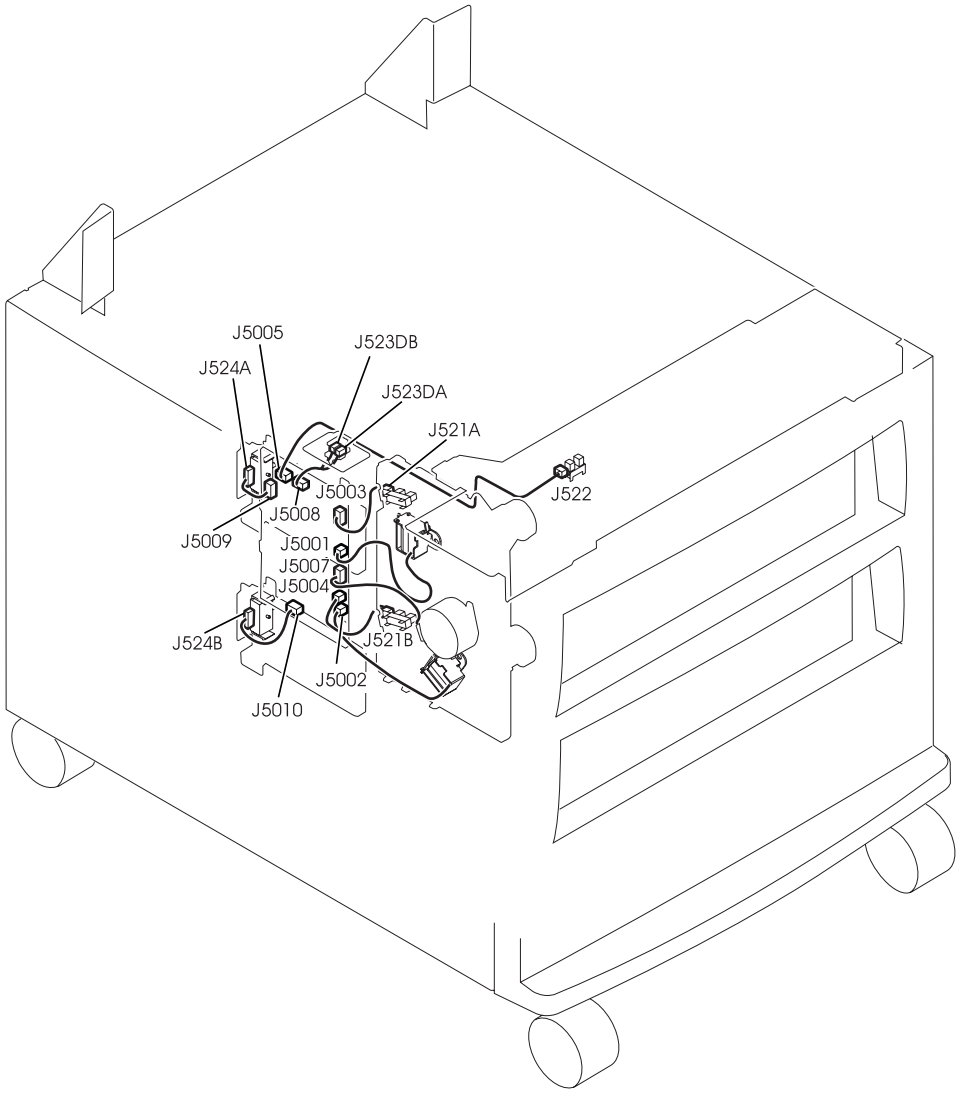


Figure 7-51 Connectors (2 x 500-sheet feeder, HP CLJ 4650 models only)

General circuit diagram

Figure 7-52 General circuit diagram (HP Color LaserJet 4600 models)

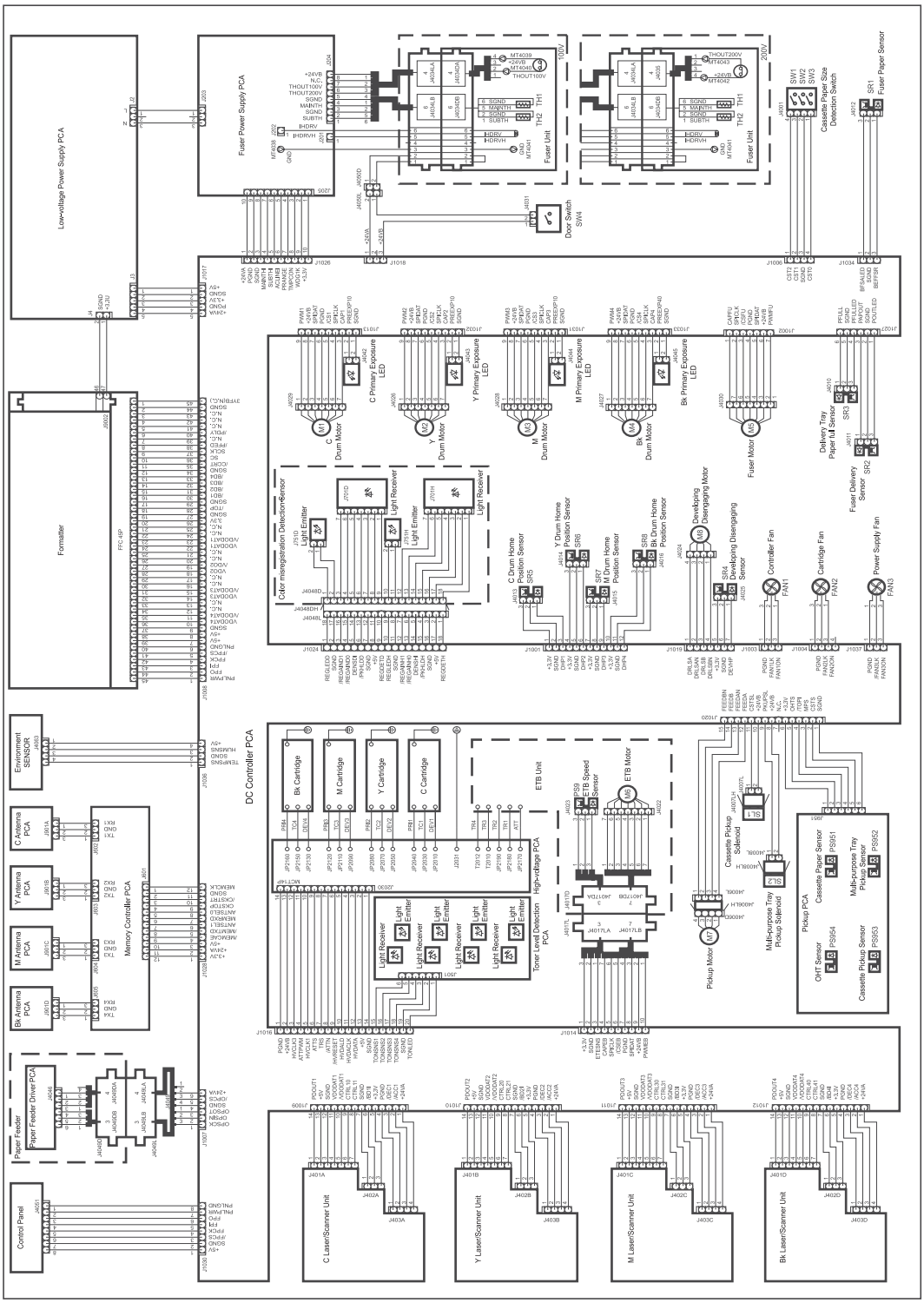


Figure 7-53 General circuit diagram (HP Color LaserJet 4610n and 4650 models)

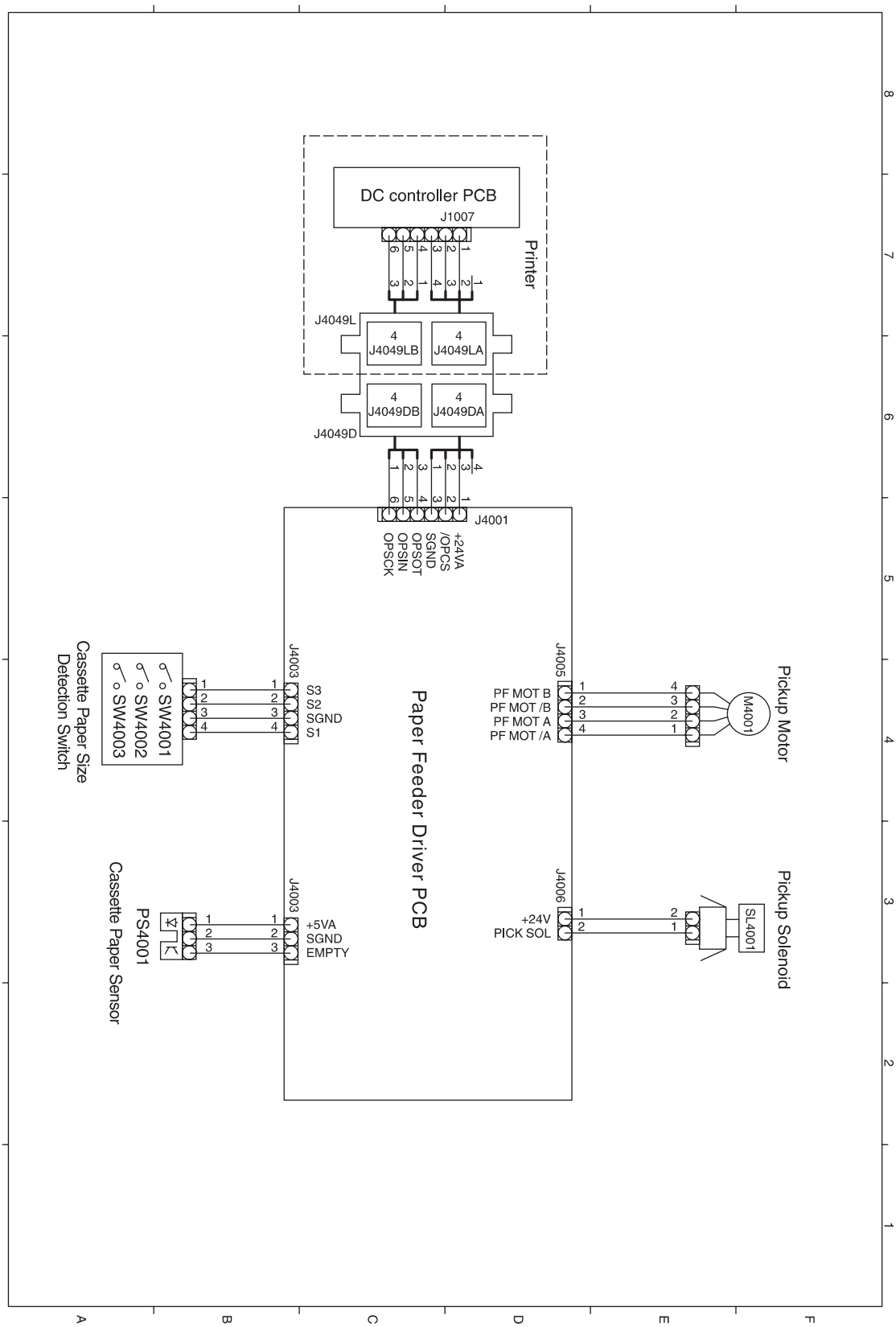


Figure 7-54 General circuit diagram (500-sheet feeder, HP CLJ 4600 and 4650 models only)

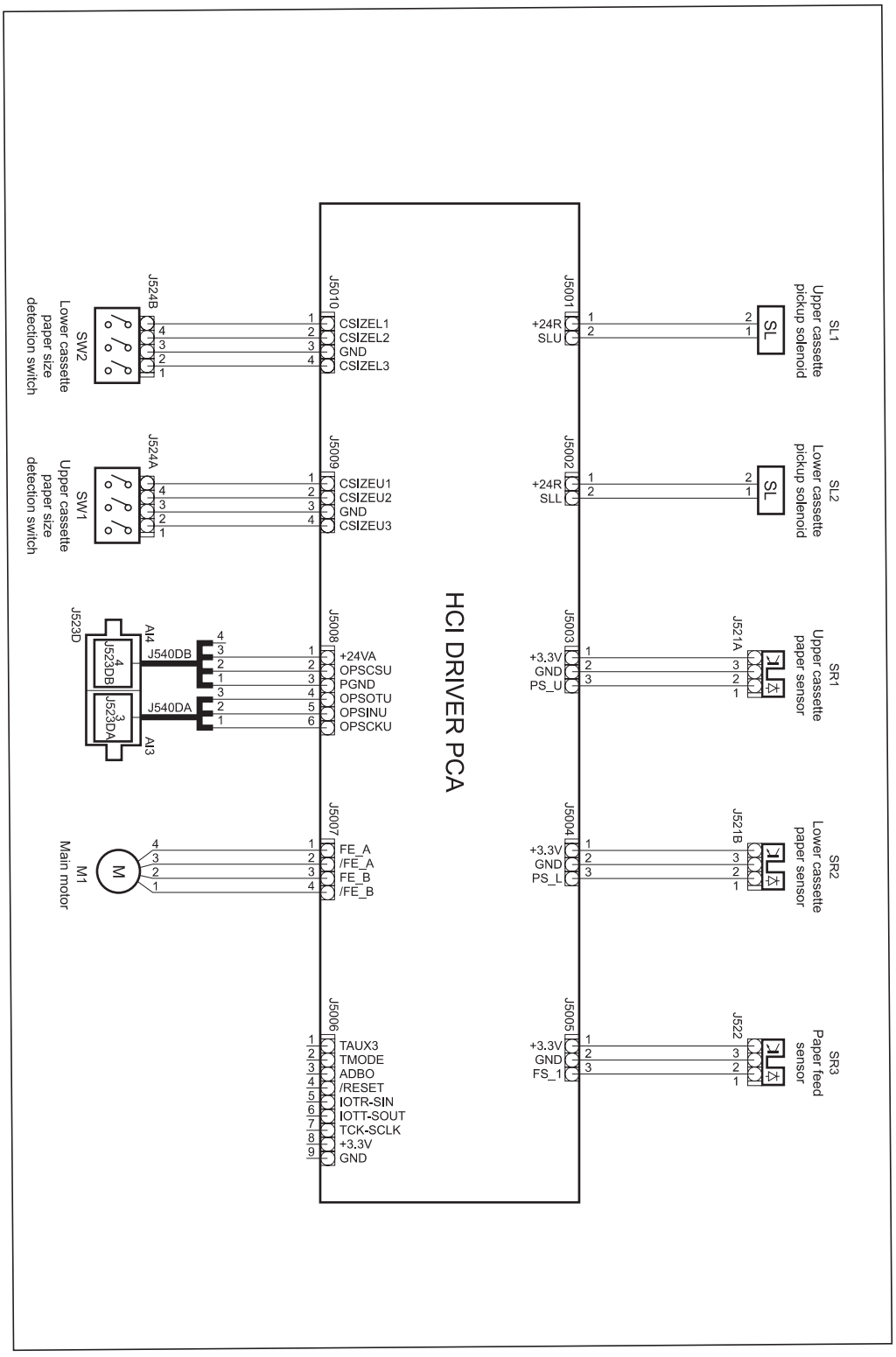


Figure 7-55 General circuit diagram (2 x 500-sheet feeder, HP CLJ 4650 models only)

8 Parts and diagrams

This chapter contains information about the following topics:

- Introduction
- Ordering parts and supplies
- Illustrations and parts lists
- External covers and panels
- Internal components
- 500-sheet paper feeder (HP CLJ 4600/4650 models only)
- 2 x 500-sheet paper feeder (HP CLJ 4650 models only)
- Alphabetical parts list
- Numerical parts list

Introduction

The figures in this chapter show the major subassemblies in the printer and their component parts. A parts list table follows each exploded assembly diagram. Each table lists the item number, the associated part number, and the description of each part.

CAUTION Be sure to order the correct part. Read the part description carefully. if a part is designated as a field replaceable unit (FRU) for the **4600 Only**, it is a replacement part for the HP Color LaserJet 4600 models only. If a part is designated as a FRU for the **4650 Only**, it is a replacement part for the HP Color LaserJet 4650 models only. If a part is designated as a FRU for the **4610n Only** or **4610n/4650 Only**, it is a replacement part for the HP Color LaserJet 4610n or the HP Color LaserJet 4610n *and* 4650 models only. If the FRU does not have a printer specific designator, it can be installed on HP Color LaserJet 4600, HP Color LaserJet 4610n, *or* HP Color LaserJet 4650 models.

When looking for part numbers for electrical components, pay careful attention to the voltage that is listed in the description column to ensure that the part number selected is for the correct printer model.

NOTE In this manual, the abbreviation "PCA" stands for "printed circuit board assembly." Components described as a PCA might consist of a single circuit board or a circuit board plus other parts, such as cables and sensors.

Ordering parts and supplies

Parts that wear

The parts on the product that need replacement at regular intervals are listed in Approximate replacement intervals for supply items. Parts are available directly from HP at the following Web site: www.hp.com/buy/parts.

Parts

Order replacement parts from the following Web site: www.hp.com/go/HPparts.

Customer support

Product documentation and software support can be found at the Web sites listed in Table 8-1 Technical support Web sites and related documentation.

Table 8-1 Technical support Web sites and related documentation

HP Connect Online (for HP partners)	Go to www.connect-online.hp.com
HP Customer Care Call Centers Information about contacting HP call centers in specific countries/regions.	Go to www.hp.com/support/callcenters
HP Online Technical Support (for HP partners) Software drivers, support documentation, and answers to frequently asked questions	Go to www.hp.com/support
HP Technical Training (North America) Classes and schedules	Go to www.compaq.com/training **NOTE** Select the appropriate country/region in the "select a country or region" field at the top, right corner of the page.
HP Parts Parts information	Go to www.partsurfer.hp.com (parts ordering) Go to www.hp.com/go/HPparts (parts reference guide)

Supplies and accessories

Use the following table to order supplies and accessories for the product.

Table 8-2 Supplies and accessories

Product number	Part number	Description
Accessories		
J6057A	J7934-61001 (new) J7934–69001 (exchange)	**4600/4650 Only**: HP Jetdirect 620n connectivity card

Table 8-2 Supplies and accessories (continued)

Product number	Part number	Description
J6035D	J6035–61051	**4610n Only** HP Jetdirect 175X USB external print server **NOTE** The HP Jetdirect 175X USB external print server (J6035D) is the only Jetdirect device that is comaptable with the HP CLJ 4610n model.
C4103A	C4103-67901	FIR pod HP Color LaserJet 4600 models)
C9667A		Printer cabinet/stand
Q3673A	Q3673–67901	**4600/4650 Only** Optional 1 X 500-sheet paper feeder and Tray 3 assembly
Q3674A	Q3674-67901	**4650 Only**: Optional 2 x 500-sheet paper feeder and Tray 3/tray 4 assembly
Cables		
C2946A		IEEE-1284 compliant parallel cable, 3 meters (approximately 10 feet) long, with 25-pin male/micro 36-pin male (a to c-type) connector
C2947A		IEEE-1284 compliant parallel cable, 10 meters (approximately 32 feet) long, with 25-pin male/micro 36-pin male (a to c-type) connector
C6518A		2-meter USB cable (a to b type connector)
C6520A		3-meter USB cable (a to b type connector)
Media		
C2934A		HP Color LaserJet Transparencies (letter) 50 sheets
C2936A		HP Color LaserJet Transparencies (A4) 50 sheets
C4179A		HP LaserJet Soft Gloss paper (letter) 200 sheets
C4179B		HP LaserJet Soft Gloss paper (A4) 200 sheets
Q1298A		HP LaserJet Tough paper (letter)
Q1298B		HP LaserJet Tough paper (A4)
HPU1132		HP Premium Choice LaserJet paper (letter)

Table 8-2 Supplies and accessories (continued)

Product number	Part number	Description
HPU1732		HP Premium Chois LaserJet paper (11 X 17)
CHP410		HP Premium Choice LaserJet paper (A4)
HPJ115R		HP LaserJet paper (letter)
CHP310		HP LaserJet paper (A4)
Memory		
J6054B	J6054-69031	**4600 Only**:Printer hard disk
J6073A	J6073-69011	**4650 Only**:Printer hard disk
C8530A	C8530-67909	**4600 Only**: 8 MB Flash DIMM
C7848A	C7848-67901	**4600 Only**: 64 MB memory DIMM (SDRAM)
C7850A	C7850-67901	**4600 Only**: 128 MB memory DIMM (SDRAM)
C9653A	C9653-67901	**4600 Only**: 256 MB memory DIMM (SDRAM)
C9712A	C9712-67918	**4600 Only**: Firmware DIMM
Q2630A	Q2630-67951	**4610n/4650 Only**: 128 MB memory DDR
Q2631A	Q2631-67951	**4610n/4650 Only**: 256 MB memory DDR
Q2632A	Q2632–67951	**4610n/4650 Only**: 512 MB memory DDR
Q2631A	Q2635-67910	**4650 Only**: Firmware Compact flash
Q2635A	Q2635–67919	**4610n Only**: Firmware CompactFlash
Control-panel overlays (4600 Only) **and labels** (4610n/4650 Only)		
	C9660-40002	English overlay (**4600 Only**)
	Q3668-67901	English label (**4610n/4650 Only**)
	C9660-40003	French overlay (**4600 Only**)
	Q3668-67902	French label (**4650 Only**)
	C9660-40004	German overlay (**4600 Only**)
	Q3668-67903	German label (**4650 Only**)
	C9660-40005	Italian overlay (**4600 Only**)
	Q3668-67904	Italian label (**4650 Only**)
	C9660-40006	Spanish overlay (**4600 Only**)
	Q3668-67905	Spanish label (**4650 Only**)
	C9660-40007	Danish overlay (**4600 Only**)

Table 8-2 Supplies and accessories (continued)

Product number	Part number	Description
	Q3668-67906	Danish label (**4650 Only**)
	C9660-40008	Dutch overlay (**4600 Only**)
	Q3668-67907	Dutch label (**4650 Only**)
	C9660-40009	Finnish overlay (**4600 Only**)
	Q3668-67908	Finnish label (**4650 Only**)
	C9660-40010	Norwegian overlay (**4600 Only**)
	Q3668-67909	Norwegian label (**4650 Only**)
	C9660-40011	Portuguese overlay (**4600 Only**)
	Q3668-67910	Portuguese label (**4650 Only**)
	C9660-40012	Swedish overlay (**4600 Only**)
	Q3668-67911	Swedish label (**4650 Only**)
	C9660-40013	Czech overlay (**4600 Only**)
	Q3668-67912	Czech label (**4650 Only**)
	C9660-40014	Hungarian overlay (**4600 Only**)
	Q3668-67913	Hungarian label (**4650 Only**)
	C9660-40015	Polish overlay (**4600 Only**)
	Q3668-67914	Polish label (**4650 Only**)
	C9660-40016	Russian overlay (**4600 Only**)
	Q3668-679015	Russian label (**4650 Only**)
	C9660-40017	Turkish overlay (**4600 Only**)
	Q3668-67916	Turkish label (**4650 Only**)
	C9660-40018	Arabic overlay (**4600 Only**)
	Q3668-67917	Arabic label (**4650 Only**)
	C9660-40019	Greek overlay (**4600 Only**)
	Q3668-67918	Greek label (**4650 Only**)
	C9660-40020	Hebrew overlay (**4600 Only**)
	Q3668-67919	Hebrew label (**4650 Only**)
	C9660-40021	Japanese overlay (**4600 Only**)
	Q3668-67920	Japanese label (**4650 Only**)
	C9660-40022	Korean overlay (**4600 Only**)
	Q3668-67921	Korean label (**4650 Only**)
	C9660-40023	Thai overlay (**4600 Only**)
	Q3668-67922	Thai label (**4650 Only**)

Table 8-2 Supplies and accessories (continued)

Product number	Part number	Description
	C9660-40024	Simplified Chinese overlay (**4600 Only**)
	Q3668-67923	Simplified Chinese label (**4650 Only**)
	C9660-40025	Traditional Chinese overlay (**4600 Only**)
	Q3668-67924	Traditional Chinese label (**4650 Only**)
Reference materials		
	5963-7863	*HP LaserJet Printer Family Paper Specifications Guide*
	5021-0330	PCL/PJL Technical Reference Package
	Q3668-90970	HP Color LaserJet 4600 Series printer service manual (this service manual is for the HP Color LaserJet 4600 models, the HP Color LaserJet 4650 models, *and* the HP Color LaserJet 4610n printer)
Supplies		
C9720A	C9720-67901	Black print cartridge
C9720A	C9720-67902	Black print cartridge (Europe)
C9721A	C9721-67901	Cyan print cartridge
	C9721-67902	Cyan print cartridge (Europe)
C9722A	C9722-67901	Yellow print cartridge
	C9722-67902	Yellow print cartridge (Europe)
C9723A	C9723-67901	Magenta print cartridge
	C9723-67902	Magenta print cartridge (Europe)
C9724A	C9660-69012 (exchange)	Image transfer kit; **4600 Only**
	RG5-6484-040CN (new)	
Q3675A	Q3675-69001 (exchange)	Image transfer kit; **4610n/4650 Only**
	RG5-7455-000CN (new)	
C9725A	C9660-67902 (exchange)	Image fuser kit (110 volt); **4600 Only**
	RG5-6493-190CN (new)	
Q3676A	Q3676-69001 (exchange)	Image fuser kit (110 volt); **4610n/4650 Only**
	RG5-7450-110CN (new)	
C9726A	C9660-69003 (exchange)	Image fuser kit (220 volt); **4600 Only**
	RG5-6517-110CN (new)	
Q3677A	Q3677-69001 (exchange)	Image fuser kit (220 volt); **4610n/4650 Only**
	RG5-7451-110CN (new)	
C9660A	C9660-67911 (exchange)	Formatter simplex; **4600 Only**

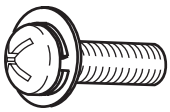
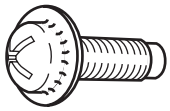
Table 8-2 Supplies and accessories (continued)

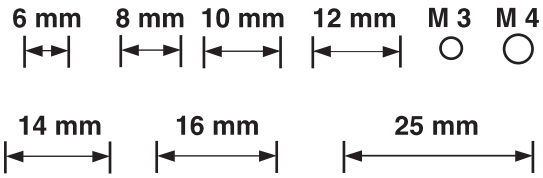
Product number	Part number	Description
	C9660-67911 (new)	
Q3999A	Q3999-69002 (exchange)	Formatter simplex/duplex; **4650 Only**
	Q3999-67092 (new)	
C9661A	C9661-69002 (exchange)	Formatter duplex; **4600 Only**
	C9661-67902 (new)	
Q7732A	Q7732–69001 (exchange)	Formatter simplex/duplex; **4610n Only**
	Q7732–67901 (new)	

NOTE The only difference between the the print cartridges is that the Europe-only print cartridges have different languages on the instruction sheet inside the box.

Common fasteners

Table 8-3 Common fasteners

Illustration	Description	Size	Part number	Uses
	Screw, machine with washer	M3x8	xA9-1276-000CN	To hold plastic to metal (for example, the skins)
	Screw, self tapping			To hold plastic to plastic
	Screw, truss head	M3x6	xA9-1275-000CN	To hold sheet metal to sheet metal (for example, the formatter pan)
	Retaining Ring (E-type)			To hold gears in place



Illustrations and parts lists

The following illustrations and parts tables list the field replaceable units (FRU) for the HP Color LaserJet 4600 Series printers. An alphabetical and a numerical master parts list are included at the end of this chapter.

Locations of major components

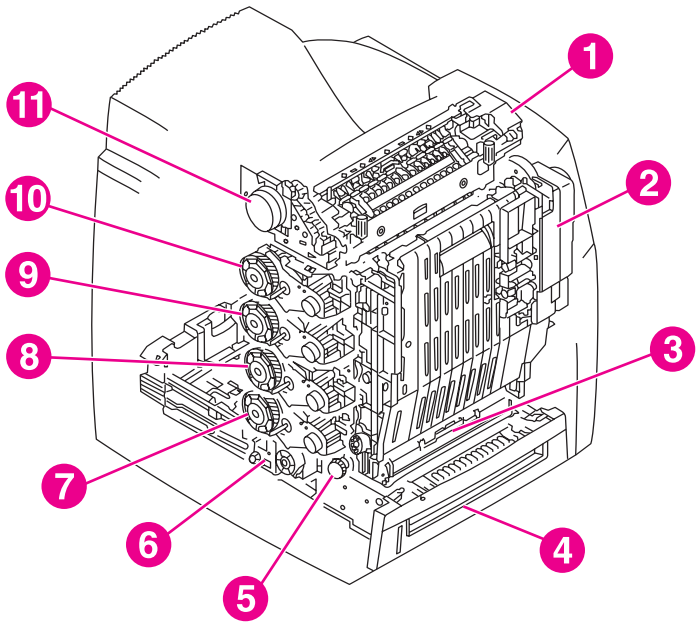


Figure 8-1 Major components of the HP Color LaserJet 4600 Series printer

1	Fuser assembly
2	ETB assembly
3	Paper pickup assembly
4	Cassette
5	Paper pickup drive assembly
6	Disengaging drive assembly
7	Drum drive assembly (cyan/magenta)
8	Drum drive assembly (yellow)
9	Drum drive assembly (cyan/magenta)
10	Drum drive assembly (black)
11	Fuser drive assembly

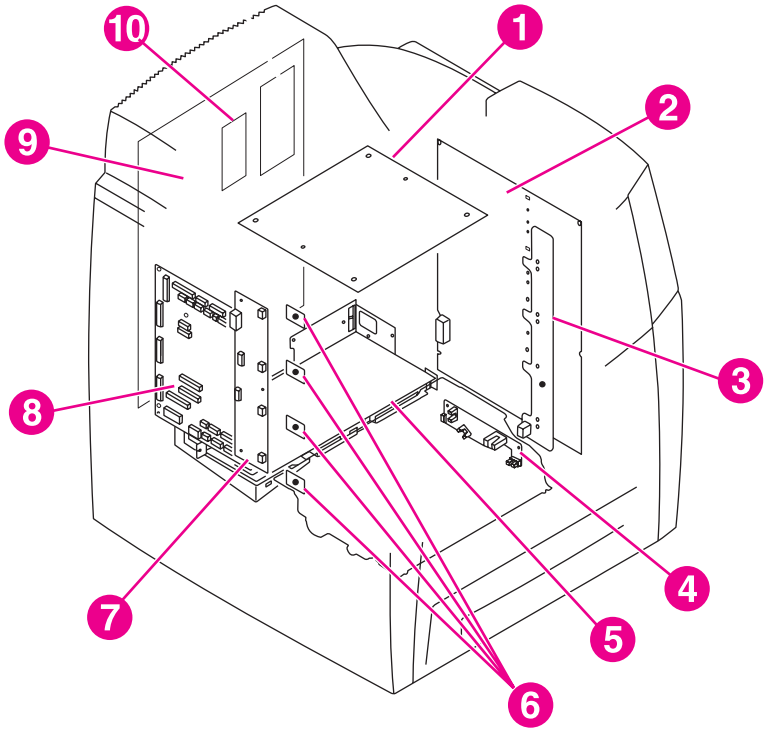


Figure 8-2 Printer PCAs

Table 8-4 Printer PCAs

Ref	Description	Part number	Qty
1	Fuser power-supply PCA 110 V	RG5-6399-030CN	1
1	Fuser power-supply PCA 220 V	RG5-6400-030CN	1
2	High-voltage power-supply PCA (new)	RG5-6395-000CN	1
2	High-voltage power-supply PCA (exchange)	C9660-69022	1
3	Toner sensor PCA	RG5-6393-000CN	1
4	Paper pickup PCA	RG5-6392-000CN	1
5	Low-voltage power supply, 110 V (new)	RG5-6410-020CN	1
5	Low-voltage power supply, 110 V (exchange)	C9660-69023	1
5	Low-voltage power supply, 220 V	RG5-6411-020CN	1
6	Memory tag antenna PCA	RG5-5469-000CN	4
7	Memory controller PCA	RG5-6396-000CN	1
8	DC controller PCA (new); **4600 Only**	RG5-6391-100CN	1
8	DC controller PCA (exchange); **4600 Only**	C9660-69020	
8	DC controller PCA; **4610n/4650 Only**	RG5-7470-030CN	1
9	Formatter, simplex, exchange; **4600 Only**	C9660-69011	1
9	Formatter simplex/duplex, exchange; **4650 Only**	Q3999-69002	1
9	Formatter, simplex, new; **4600 Only**	C9660-67901	1
9	Formatter simplex/duplex, new; **4650 Only**	Q3999-67902	1
9	Formatter, duplex, exchange; **4600 Only**	C9661-69002	1
9	Formatter, duplex, new; **4600 Only**	C9660-67902	1
9	Formatter, simplex, new; **4610n Only**	Q7732–67901	1
9	Formatter, simplex, exchange; **4610n Only**	Q7732–69001	1
10	Firmware DIMM; **4600 Only**	C9712-67908	1
10	CompactFlash; **4650 Only**	Q2635-67910	1
10	CompactFlash; **4610n Only**	Q2635–67919	1

External covers and panels

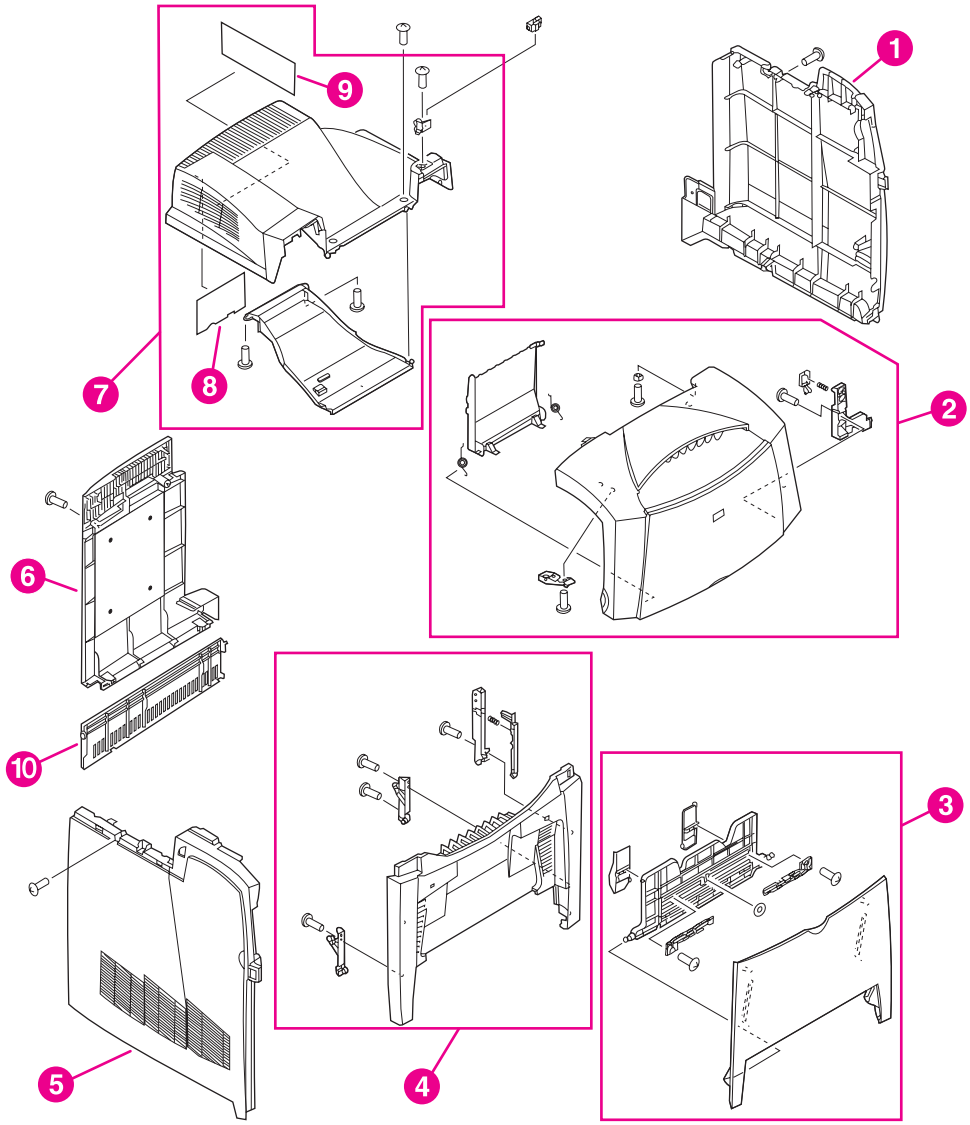


Figure 8-3 External covers and panels

Table 8-5 External covers and panels

Ref	Description	Part number	Qty
1	Right cover	RB2–8591–000CN	1
2	Top cover assembly	RG5-6465-000CN	1
3	Multipurpose tray assembly (tray 1)	RG5-6467-000CN	1
4	Front cover assembly	RG5-6466-000CN	1
5	Left cover	RB2-8590-040CN	1
6	Rear cover assembly	RG5-8592-000CN	1
7	Rear top cover assembly	RG5-6464-000CN	1
8	Filter, rear	RB2-8596-000CN	1
9	Filter, left side	RB3-0607-000CN	1
10	Rear cover, lower	RB2–8593–000CN	1

Internal components

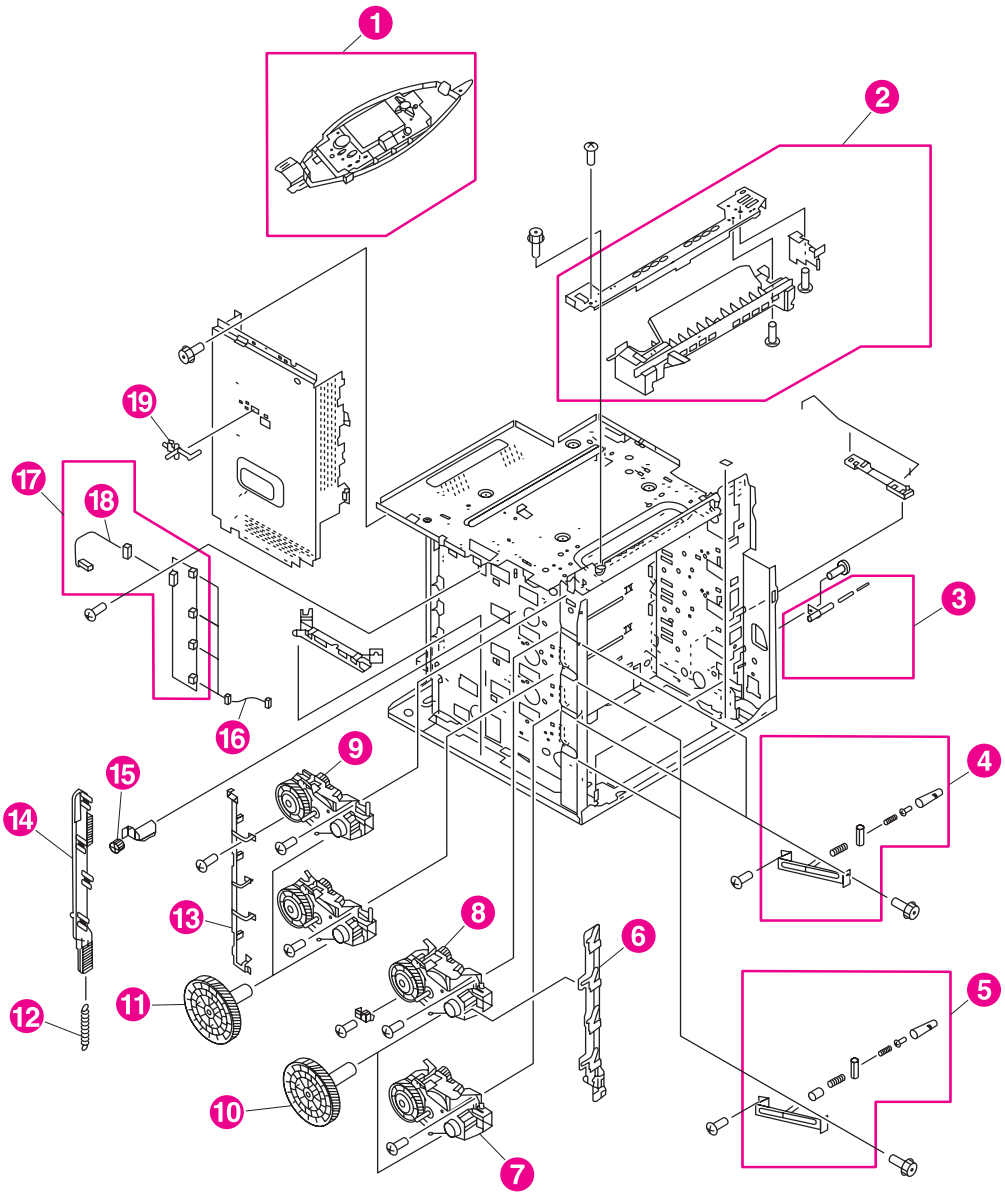


Figure 8-4 Internal components (1 of 5)

Table 8-6 Internal components (1 of 5)

Ref	Description	Part number	Qty
1	Control-panel assembly, 110 V; **4600 Only**	RG5-6432-040CN	1
1	Control-panel assembly, 220 V; **4600 Only**	RG5-6433-040CN	1
1	Operational-panel assembly, 110 V; **4610n/4650 Only**	RG5–6432–040CN	1
2	Control-panel cross-member assembly	RG5-6510-000CN	1
3	Contact-pin assembly	RG5-6492-000CN	1
4	Drum-grounding assembly (black and yellow), short	RG5-6474-000CN	2
5	Drum-grounding assembly (cyan and magenta), long	RG5-7362-000CN	2
6	Plate, drive interlock	RB2-8225-000CN	1
7	Drum drive assembly (cyan and magenta)	RG5-7467-000CN	2
8	Drum drive assembly (yellow)	RG5-7469-000CN	1
9	Drum drive assembly (black)	RG5-7468-000CN	1
10	Gear 200T (cyan and magenta)	RS7-0137-000CN	2
11	Gear 200T (black and yellow)	RS7-0138-000CN	2
12	Spring tension	RS6-2537-000CN	1
13	Plate, drive grounding	RB2-8255-000CN	1
14	Plate, developer disengagement (change plate)	RB2-8239-000CN	1
15	Gear 17T	RS7-0139-000CN	1
16	Cable, antenna	RG5-6418-000CN	4
17	Antenna memory PCA assembly	RG5-6396-000CN	1
18	Cable, memory; **4600 Only**	RG5-6420-000CN	1
19	Arm, test print	RB2-8250-000CN	1

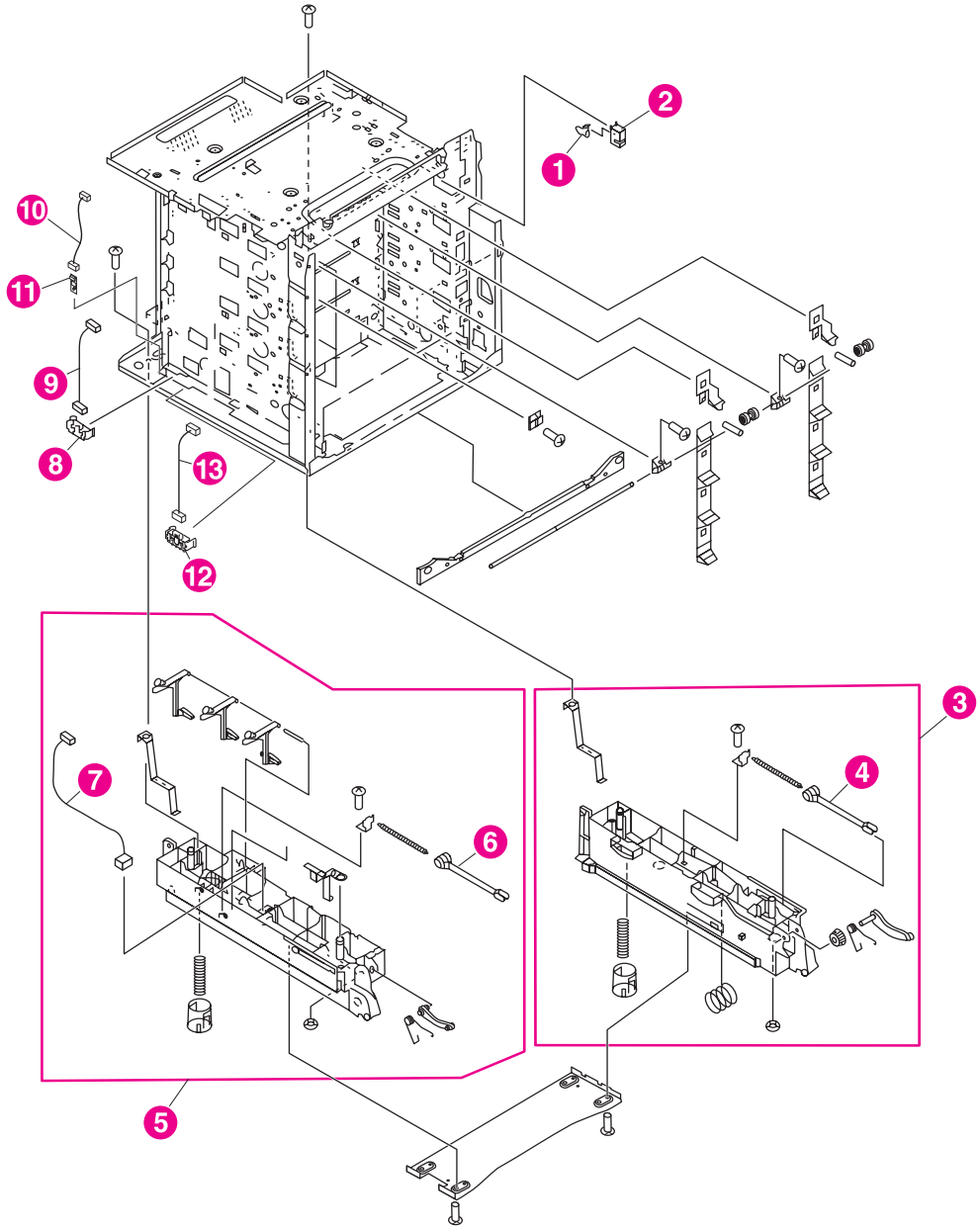


Figure 8-5 Internal components (2 of 5)

Table 8-7 Internal components (2 of 5)

Ref	Description	Part number	Qty
1	Lever, cartridge pressure	RB2-8195-000CN	4
2	Cover, cartridge; **4610n/4650 Only**	RB2-8196-000CN	4
3	Cassette-frame right assembly	RG5-6460-000CN	1
4	Rod, spring	RB2-8213-000CN	1
5	Cassette frame left assembly	RG5-6459-000CN	1
6	Rod, spring	RB2-8213-000CN	1
7	Cable/connector, optional feeder	RG5-6430-000CN	1
8	Switch, cassette paper size	WC2-5452-000CN	1
9	Cable, cassette size (optional)	RG5-6430-000CN	1
10	Cable, environment sensor; **4610n/4650 Only**	RG5-7471-000CN	1
11	Environment/humidity sensor; **4610n/4650 Only**	WP2-5138-000CN	1
12	Switch, push	WC2-5452-000CN	1
13	Cable, cassette size	RG5-6431-000CN	1

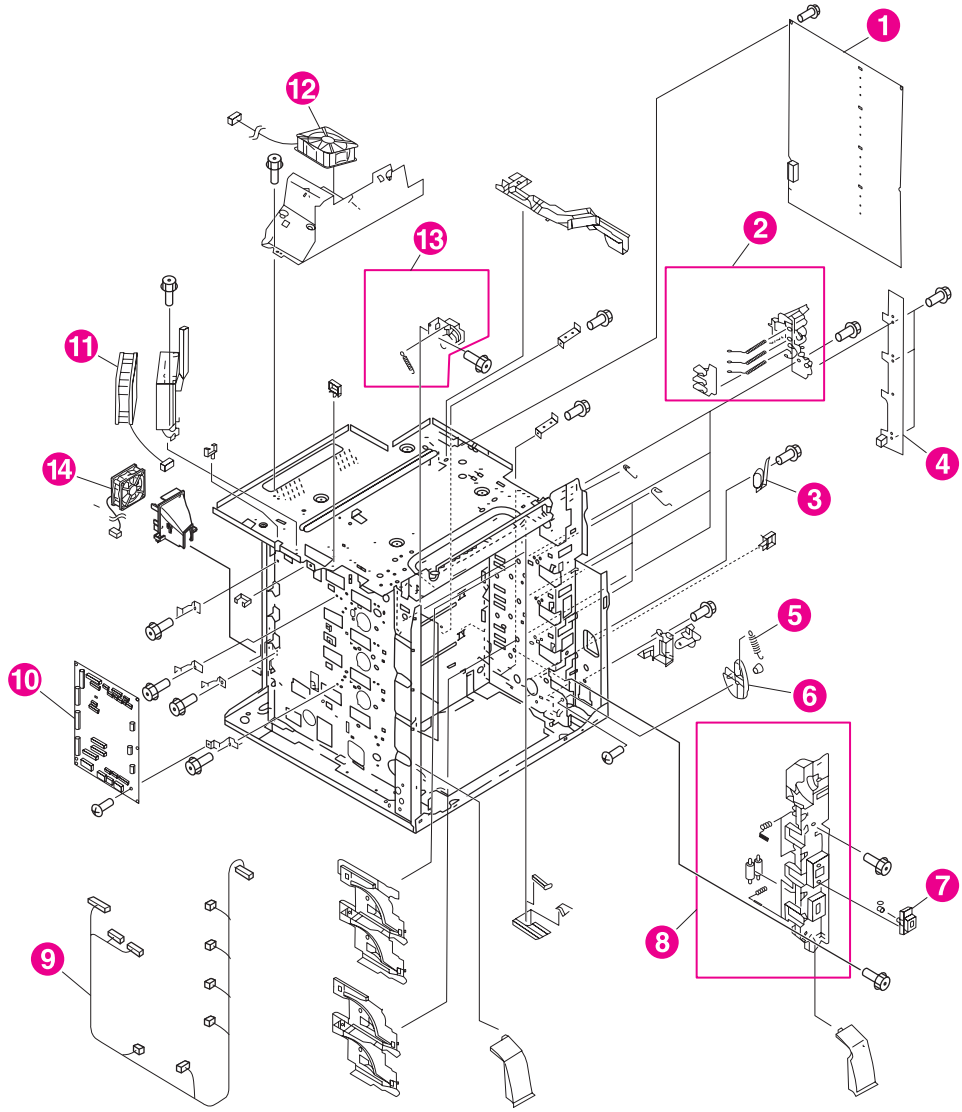


Figure 8-6 Internal components (3 of 5)

Table 8-8 Internal components (3 of 5)

Ref	Description	Part number	Qty
1	High-voltage power-supply PCA assembly (new)	RG5-6395-000CN	1
1	High-voltage power-supply PCA assembly (exchange)	C9660-69022	1
2	HVT terminal assembly	RG5-6449-000CN	4
3	Microswitch, front cover	WC4-5169-000CN	1
4	Toner-sensor PCA	RG5-6393-000CN	1
5	Spring, tension	RS6-2511-000CN	1
6	Arm, pressure	RB2-8151-020CN	1
7	Connector, drawer	WS3-5746-000CN	1
8	Cartridge, inlet assembly	RG5-6450-000CN	1
9	Cable, left plate	RG5-6413-000CN	1
10	DC controller PCA assembly; **4600 Only**	RG5-6391-000CN	1
10	DC controller PCA assembly; **4610n/4650 Only**	RG5-7470-000CN	1
11	Fan, formatter	RH7-1490-000CN	1
12	Fan, cartridge	RH7-1491-000CN	1
13	ETB latch assembly	RG5-6456-000CN	1
14	Fan, lower (power-supply fan); **4610n/4650 Only**	RH7-1607-000CN	1

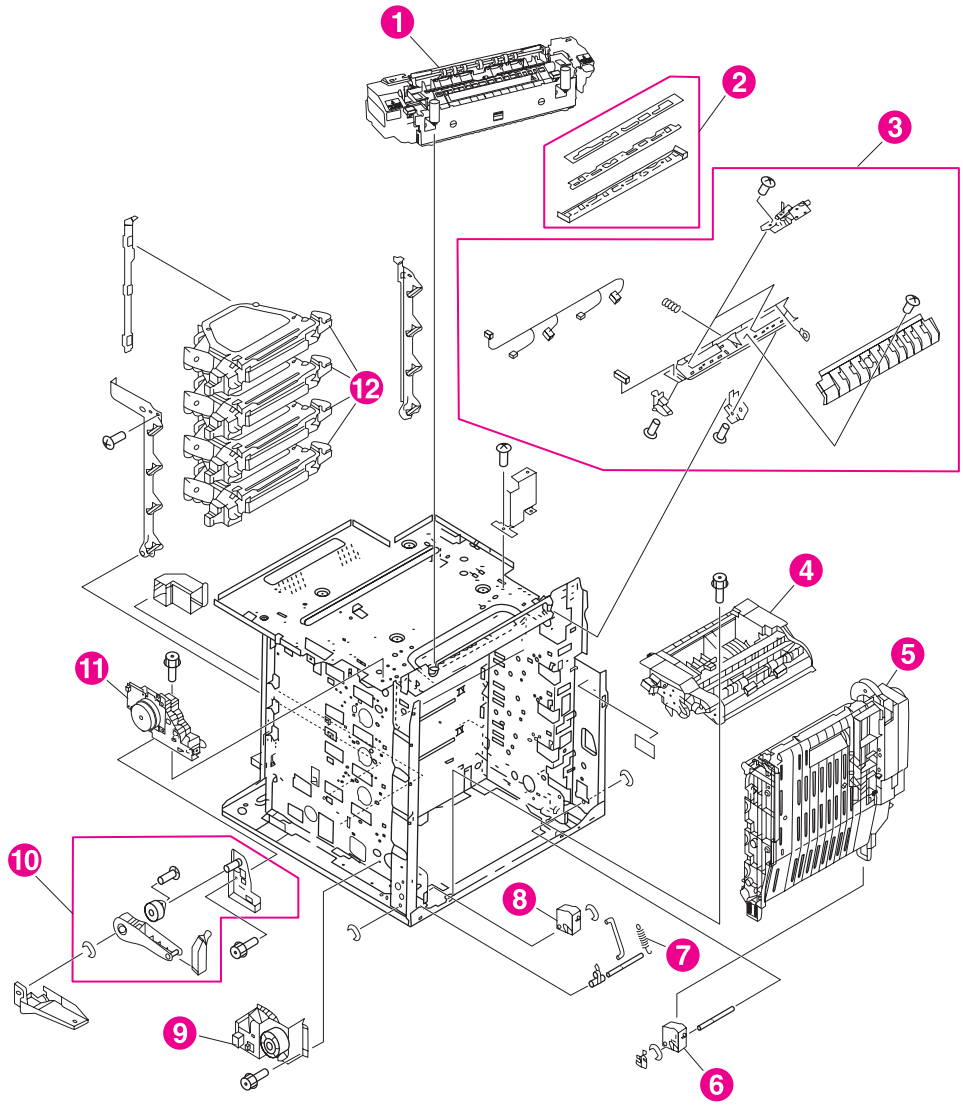


Figure 8-7 Internal components (4 of 5)

Table 8-9 Internal components (4 of 5)

Ref	Description	Part number	Qty
1	Fuser, 110 V **4600 Only**	RG5-6493-190CN	1
1	Fuser, 110 V; **4610n/4650 Only**	RG5-7450-110CN	1
1	Fuser 220, V; **4600 Only**	RG5-6517-110CN	1
1	Fuser, 220 V; **4610n/4650 Only**	RG5-7451-000CN	1
2	Static eliminator; **4600 Only**	RF5-3773-000CN	1
3	Color-registration-detection assembly	RG5-6454-000CN	1
4	Paper pickup assembly; **4600 Only**	RG5-6468-000CN	1
4	Paper pickup assembly; **4610n/4650 Only**	RG5-7453-000CN	1
5	ETB assembly; **4600 Only**	RG5-6484-040CN	1
5	ETB assembly; **4610n/4650 Only**	RG5-7455-000CN	1
6	Cap, right	RB2-8124-000CN	1
7	Spring, tension	RS6-2511-000CN	1
8	Cap, left	RB2-8121-000CN	1
9	Developing disengaging drive assembly	RG5-6507-000CN	1
10	Damper assembly (top cover hinge)	RG5-6446-000CN	1
11	Fuser drive assembly; **4600 Only**	RG5-6512-000CN	1
11	Fuser drive assembly; **4610n/4650 Only**	RG5-7452-000CN	1
12	Laser/scanner assembly; **4600 Only**	RG5-6390-000CN	1
12	Laser/scanner assembly **4610n/4650 Only**	RG5-7475-000CN	1

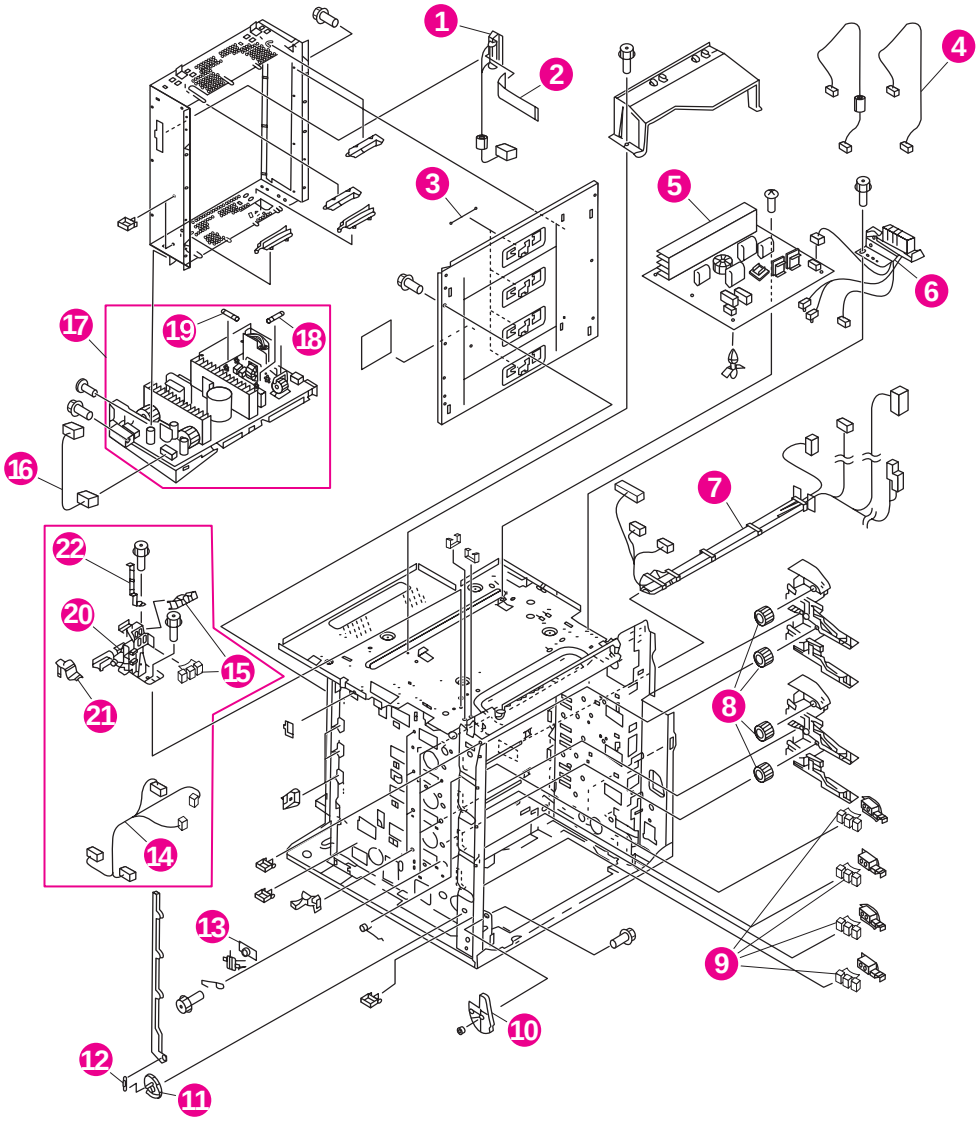


Figure 8-8 Internal components (5 of 5)

Table 8-10 Internal components (5 of 5)

Ref	Description	Part number	Qty
1	Cable, interface	RG5-6422-000CN	1
2	Cable, flat	RH2-5471-000CN	1
3	Spring, scanner support	RB2-8246-000CN	4
4	Cable, ac, 110 V	RG5-6427-000CN	1
4	Cable, ac, 220 V	RG5-6434-000CN	1
5	Fuser power-supply PCA, 110 V	RG5-6399-030CN	1
5	Fuser power-supply PCA, 220 V	RG5-6400-050CN	1
6	Cable/connector, fuser; **4600 Only**	RG5-6425-000CN	1
6	Cable/connector, fuser; **4610n/4650 Only**	RG5-7480-000CN	1
7	Cable, relay	RG5-6414-000CN	1
8	Gear 29T	RS7-0136-020CN	4
9	Photo interrupter, TLP1241	WG8-5362-000CN	4
10	Gear, pressure	RB2-8122-020CN	1
11	Cam/gear 66T	RS7-0135-000CN	1
12	Spring, tension	RS6-2510-000CN	1
13	Memory-tag-antenna PCA assembly	RG5-5469-000CN	4
14	Cable, sensor	RG5-6423-000CN	1
15	Photo interrupter, TLP1241	WG8-5362-000CN	2
16	Cable, dc power supply	RG5-6415-000CN	1
17	Low-voltage power-supply assembly, 110 V	RG5-6410-020CN	1
17	Low-voltage power-supply assembly, 220 V	RG5-6411-020CN	1
18	Fuse, 125 V, 6.3 A, 110 V	VD7-2356-301CN	1
18	Fuse, 250 V, 4 A, 220 V	VD7-0644-001CN	1
19	Fuse, 250 V, 20 A, 110 V	VD7-1732-002CN	1
19	Fuse, 250 V, 8 A, 220 V	VD7-1838-001CN	1
20	Bracket, sensor	RB2-8540-000CN	1
21	Cover, sensor	RB2-8541-000CN	1
22	Plate, grounding	RB2-8542-000CN	1

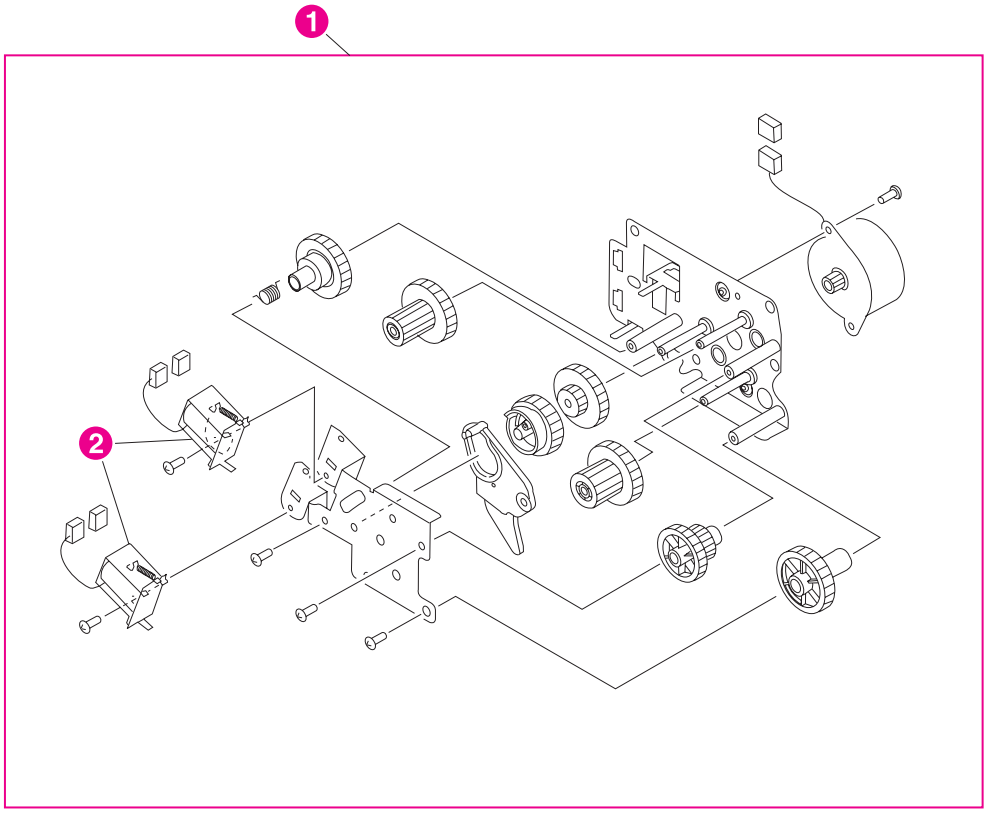


Figure 8-9 Paper pickup-drive assembly

Table 8-11 Paper pickup-drive assembly

Ref	Description	Part number	Qty
1	Paper pickup assembly; **4600 Only**	RG5-6469-000CN	1
1	Paper pickup assembly; **4610n/4650 Only**	RG5-7466-000CN	1
2	Solenoid	RH7-5319-000C	2

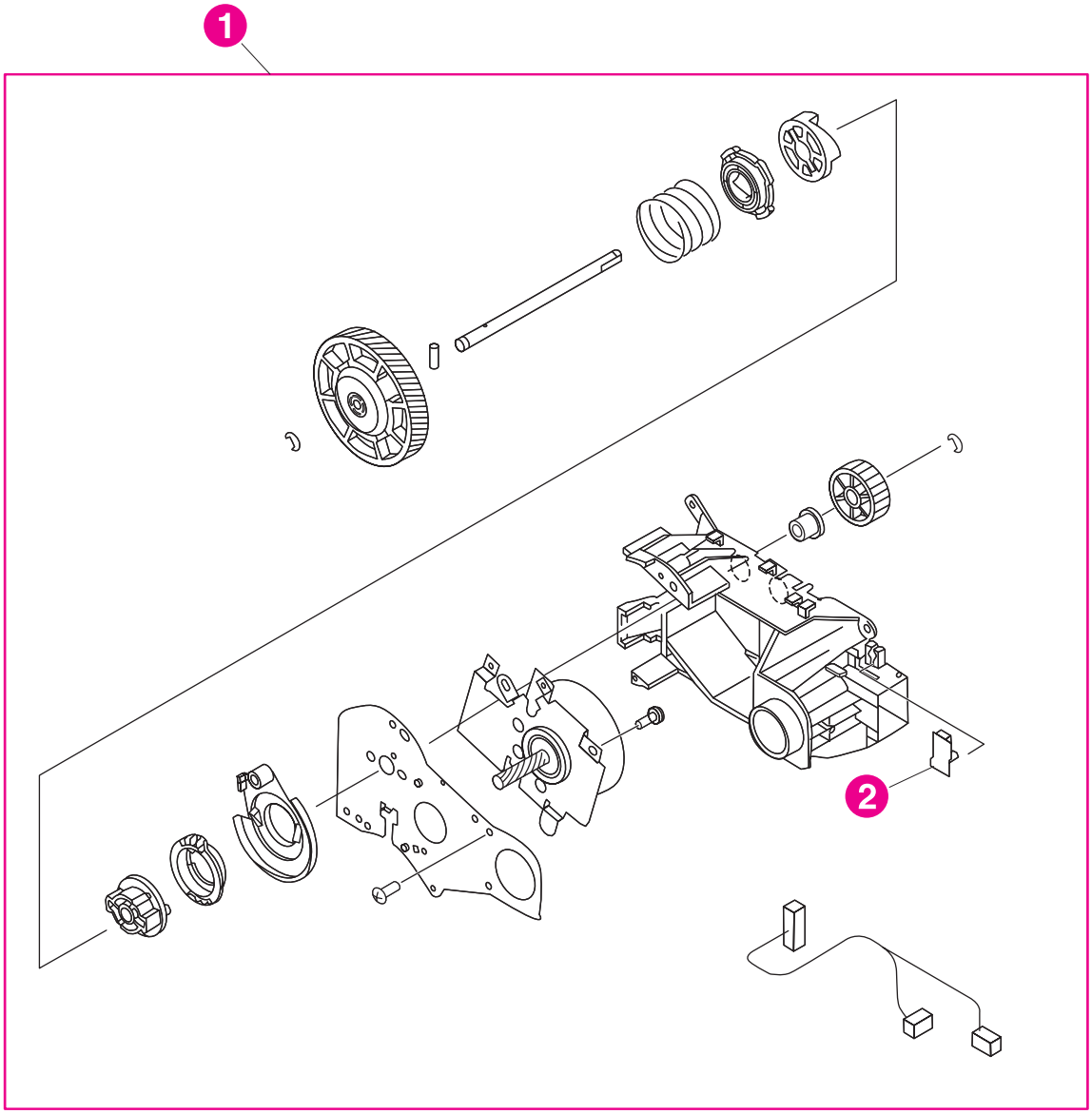


Figure 8-10 Drum drive assembly

Table 8-12 Drum drive assembly

Ref	Description	Part number	Qty
1	Drum drive assembly (cyan/magenta)	RG5-7467-000CN	2
1	Drum drive assembly (black)	RG5-7468-000CN	1
1	Drum drive assembly (yellow)	RG5-7469-000CN	1
2	LED PCA assembly	RG5-6394-000CN	1

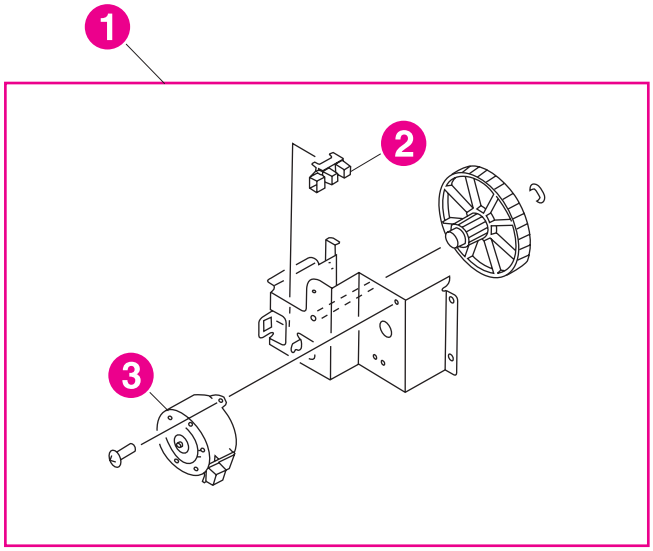


Figure 8-11 Disengaging drive assembly

Table 8-13 Disengaging drive assembly

Ref	Description	Part number	Qty
1	Disengaging drive assembly	RG5-6507-020CN	1
2	Photo interrupter, TLP1241	WG8-5362-000CN	1
3	Motor, M7, developing disengaging stepping	RH7-1494-000CN	1

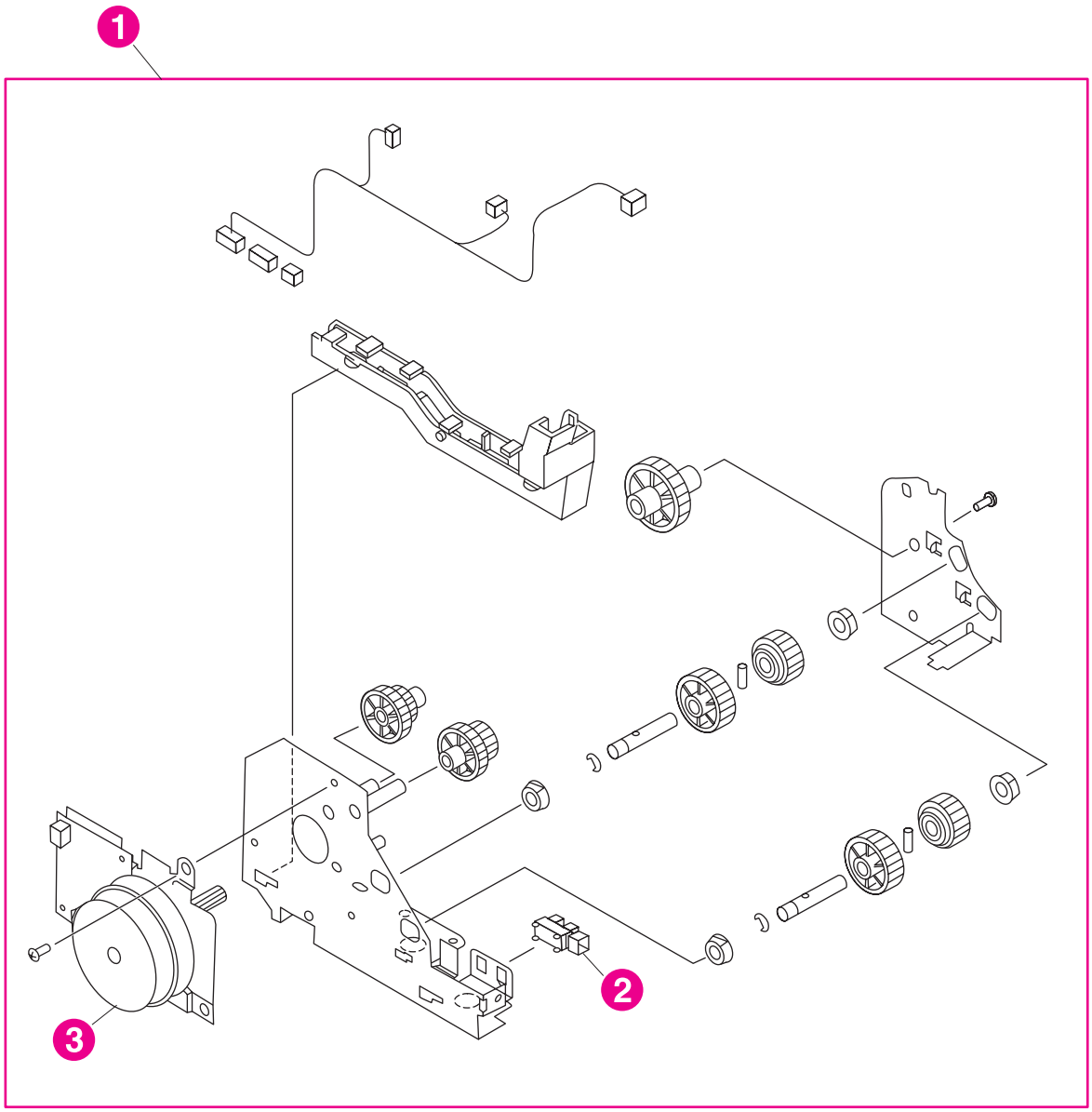


Figure 8-12 Fuser drive assembly

Table 8-14 Fuser drive assembly

Ref	Description	Part number	Qty
1	Fuser drive assembly; **4600 Only**	RG5-6512-000CN	1
1	Fuser drive assembly; **4610n/4650 Only**	RG5-7452-000CN	1
2	Photo interrupter, TLP1241	WG8-5362-000CN	1
3	Motor, M8, fuser, DS, brushless, 24 V **4600 Only**	RH7-1495-000CN	1
3	Motor, M8, fuser, DS, brushless, 24 V; **4610n/4650 Only**	RH7-1605-000CN	1

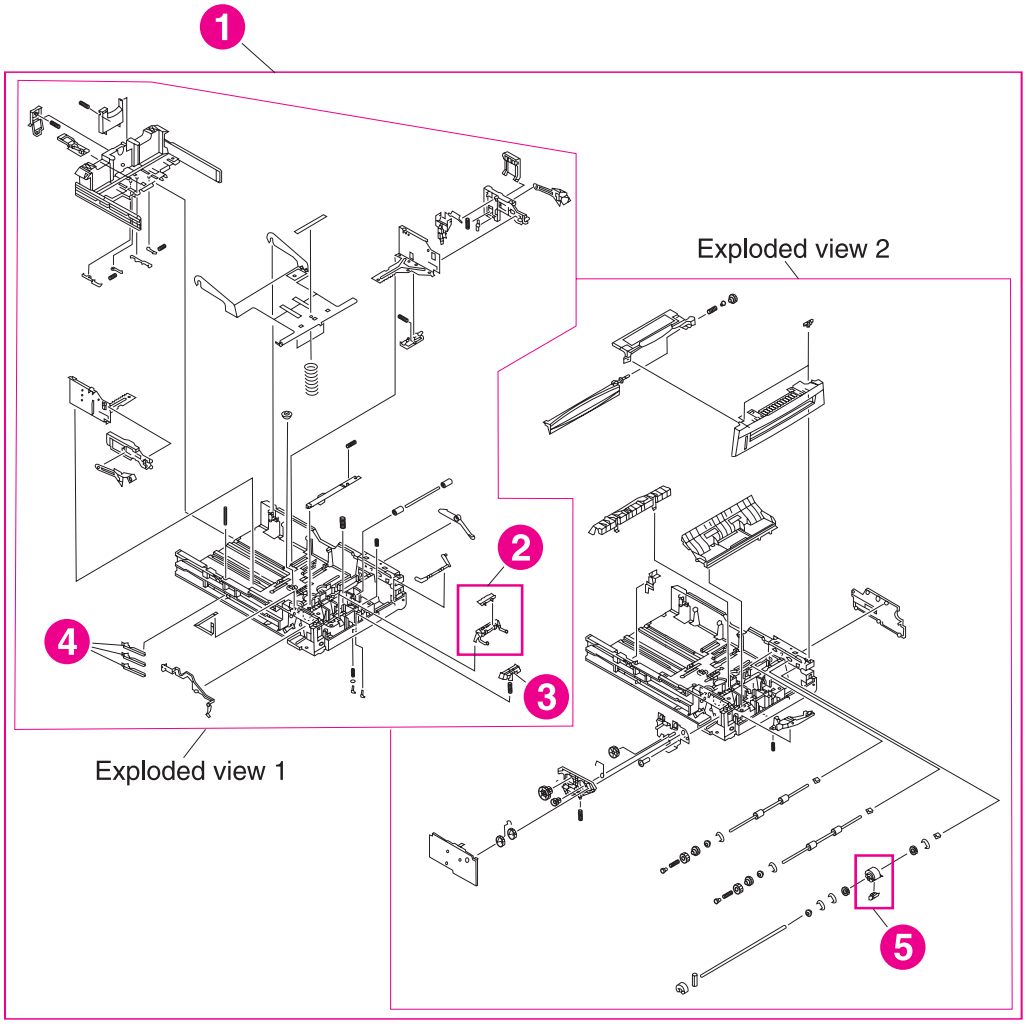


Figure 8-13 Cassette (tray 2)

Table 8-15 Cassette (tray 2)

Ref	Description	Part number	Qty
1	Cassette (tray 2); **4600 Only**	RG5-6476-090CN	1
1	Cassette (tray 2); **4610n/4650 Only**	RG5-7459-000CN	1
2	Separation pad	RF5-3750-020CN	1
3	Plate, separation assembly	RF5-3749-000CN	1
4	Arm, paper-size	RB2-8349-000CN	3
5	Multipurpose tray pickup roller assembly	RG9-1529-000CN	1

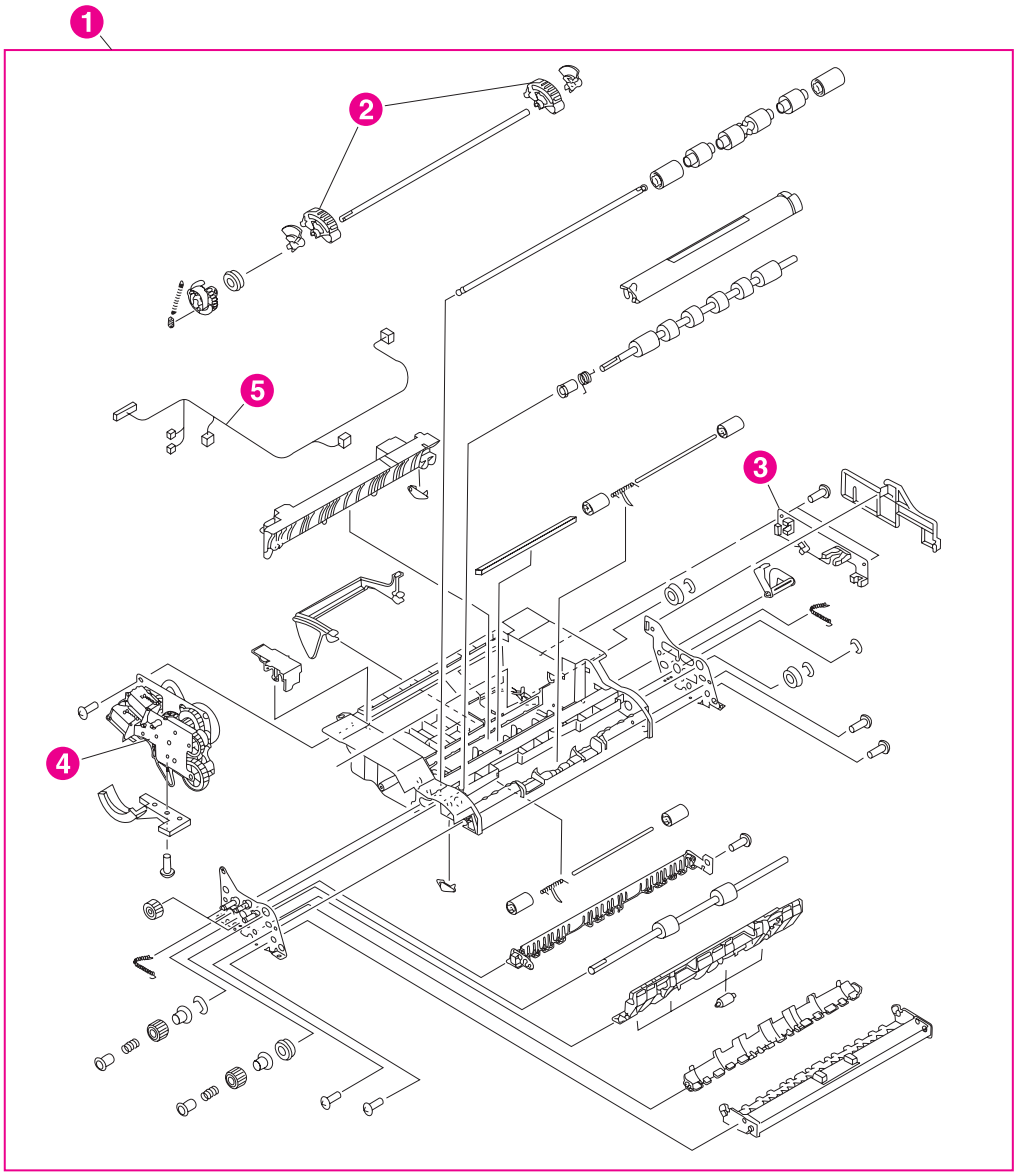


Figure 8-14 Paper pickup assembly

Table 8-16 Paper pickup assembly

Ref	Description	Part number	Qty
1	Paper pickup assembly; **4600 Only**	RG5-6468-040CN	1
1	Paper pickup assembly; **4610n/4650 Only**	RG5-7453-040CN	1
2	Roller, paper pickup	RF5-3739-000CN	2
3	Paper-sensor PCA assembly	RG5-6392-000CN	1
4	Paper pickup drive assembly; **4600 Only**	RG5-6469-000CN	1
4	Paper pickup drive assembly; **4610n/4650 Only**	RG5-7466-000CN	1
5	Cable, paper-feed	RG5-6419-000CN	1

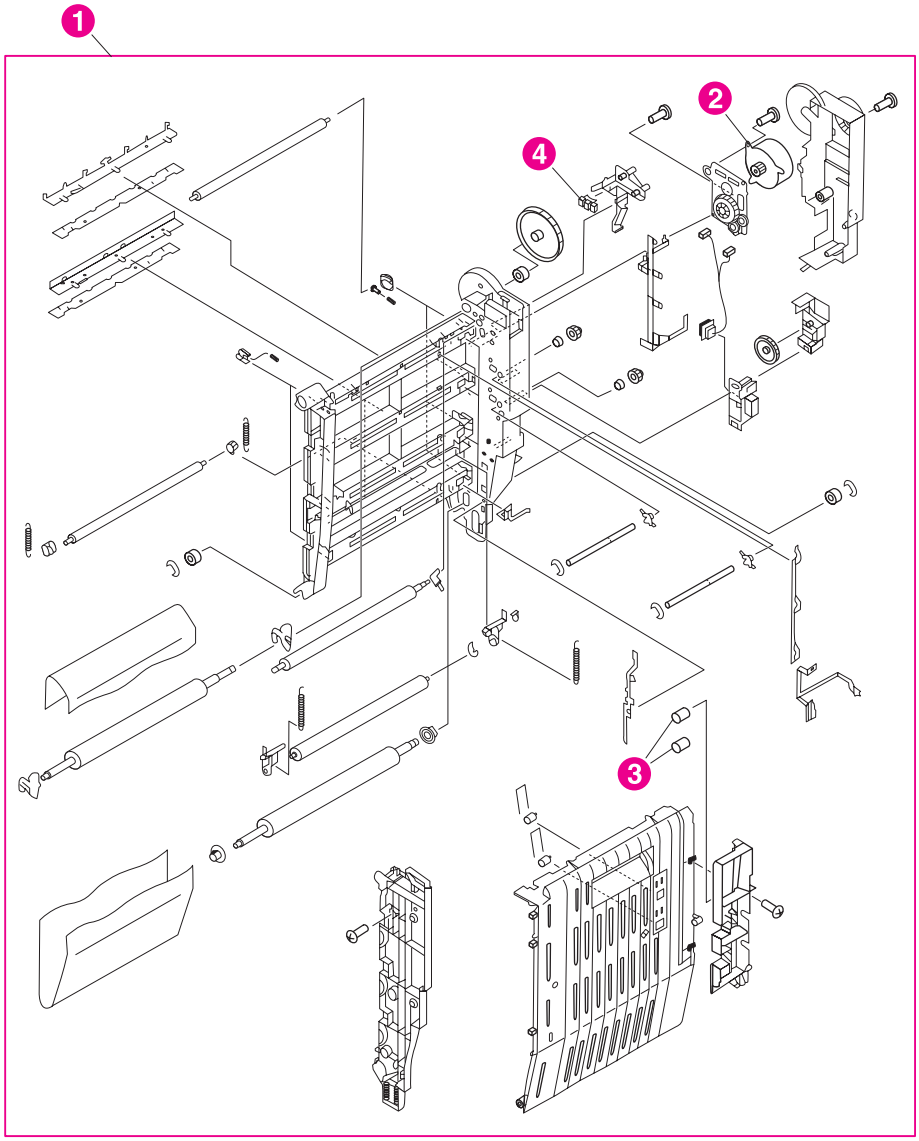


Figure 8-15 ETB assembly

Table 8-17 ETB assembly

Ref	Description	Part number	Qty
1	ETB assembly; **4600 Only**	RG5-6484-070CN	1
1	ETB assembly; **4610n/4650 Only**	RG5-7455-000CN	1
2	Motor, M6, ETB, DC, brushless, 24 V **4600 Only**	RH7-1495-000CN	1
2	Motor, M6, ETB, DC, brushless, 24 V; **4610n/4650 Only**	RH7-1605-000CN	1
3	Roller, oblique	RB1-2155-000CN	2
4	Photo interrupter, TLP1241	WG8-5362-000CN	1

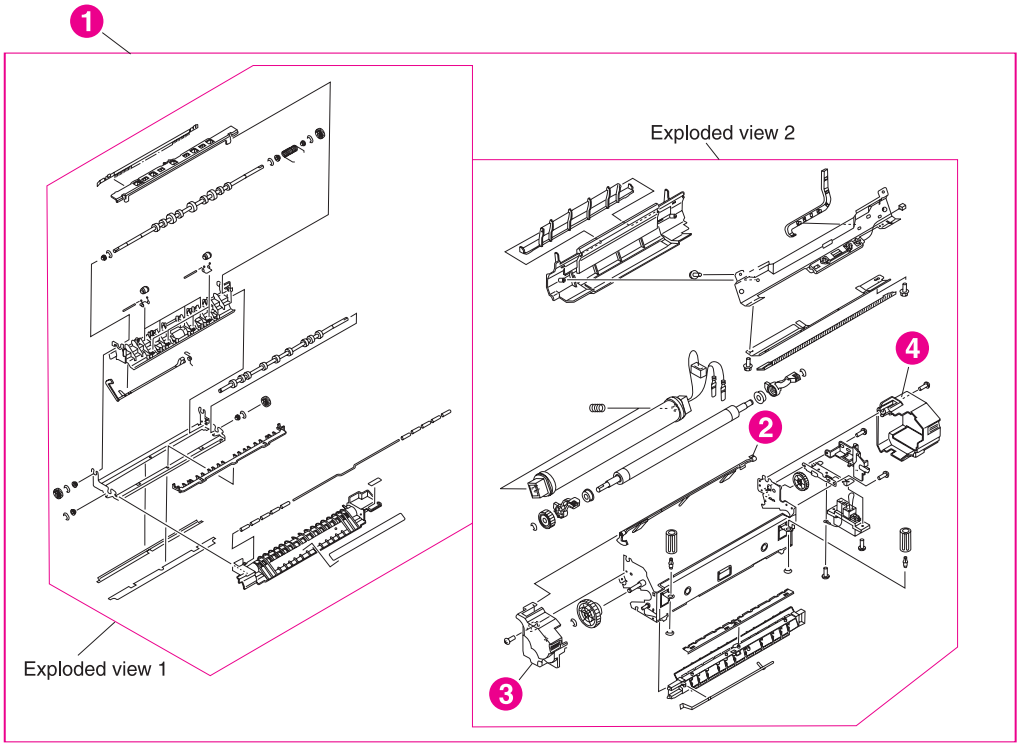


Figure 8-16 Fuser assembly

Table 8-18 Fuser assembly

Ref	Description	Part number	Qty
1	Fuser assembly, 110 V; **4600 Only**	RG5-6493-190CN **4600 Only**	1
1	Fuser assembly, 110 V; **4610n/4650 Only**	RG5-7450-110CN	1
1	Fuser assembly, 220 V; **4600 Only**	RG5-6517-110CN	1
1	Fuser assembly, 220 V; **4610n/4650 Only**	RG5-7451-110CN	1
2	Sensor flag	RB2-8498-030CN	1
3	Fuser cover, left	RF5-3774-030CN	1
4	Fuser cover, right	RF5-3775-030CN	1

500-sheet paper feeder (HP CLJ 4600/4650 models only)

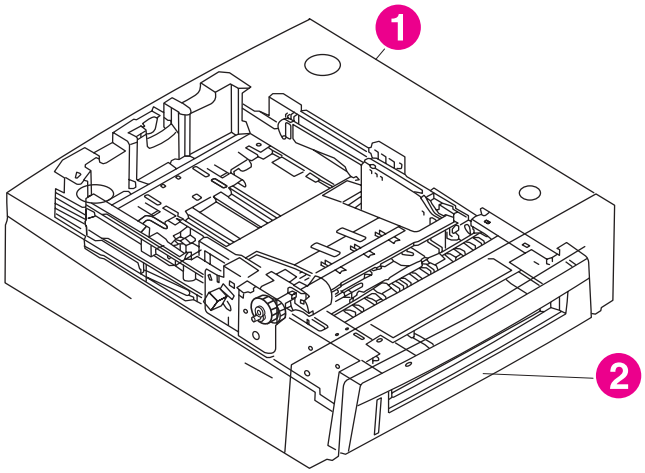


Figure 8-17 500-sheet paper feeder assembly (HP CLJ 4600/4650 models only)

Table 8-19 500-sheet paper feeder assembly

Ref	Description	Part number	Qty
1	500-sheet paper feeder and tray 3 assembly; **4600/4650 Only**	Q3673-67901	1
2	Cassette, 500-sheet paper feeder	RG1-4140-080CN	1

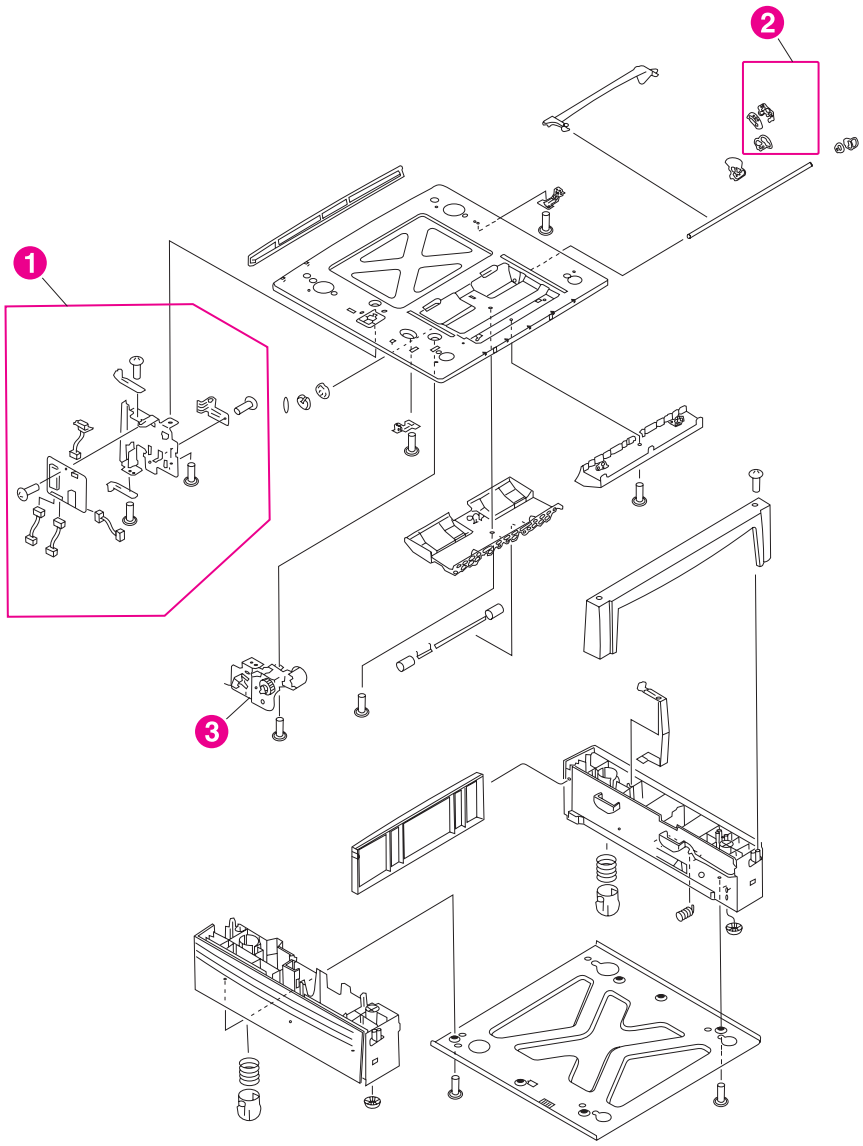


Figure 8-18 500-sheet paper feeder internal components

Table 8-20 500-sheet paper feeder internal components

Ref	Description	Part number	Qty
1	Paper feeder PCA assembly; **4600 Only**	RG1-4139-000CN	1
1	Paper feeder PCA assembly; **4610n/4650 Only**	RG5-7542-000CN	1
2	Roller, paper pickup	RF5-3739-000CN	1
3	Paper feeder drive assembly; **4600 Only**	RG1-4138-020CN	1
3	Paper feeder drive assembly; **4610n/4650 Only**	RG5-7541-000CN	1

2 x 500-sheet paper feeder (HP CLJ 4650 models only)

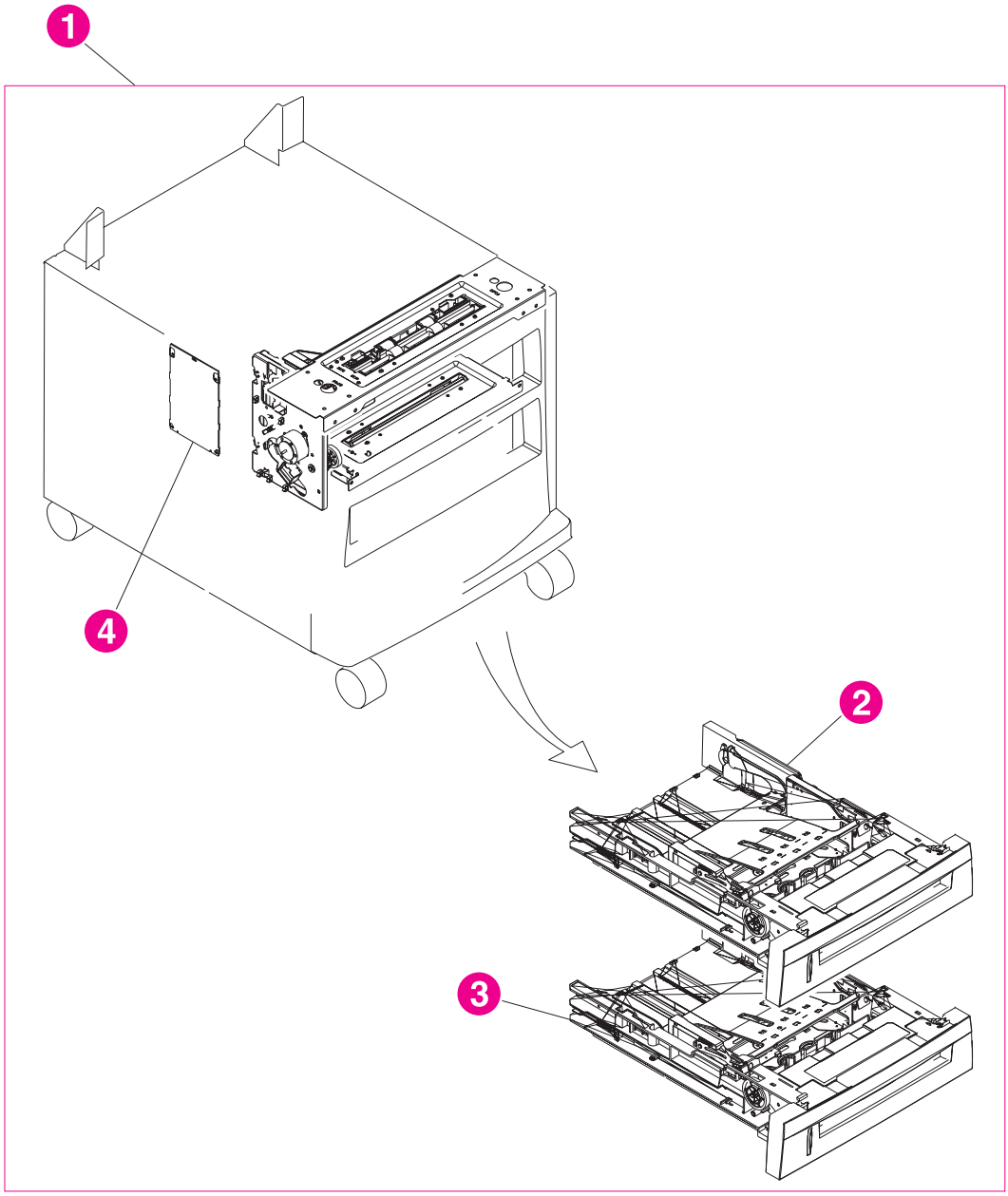


Figure 8-19 2 x 500-sheet paper feeder (HP CLJ 4650 models only)

Table 8-21 2 x 500-sheet paper feeder (HP CLJ 4650 models only)

Ref	Description	Part number	Qty
1	2 x 500-sheet feeder/tray assembly; **4650 Only**	Q3674-67901	1
2	2 x 500 upper cassette; **4650 Only**	RG5-7535-000CN	1
3	2 x 500 lower cassette; **4650 Only**	RG5-7534-000CN	1
4	2 x 500 paper feeder driver PCA assembly; **4650 Only**	RG5-7518-000CN	1

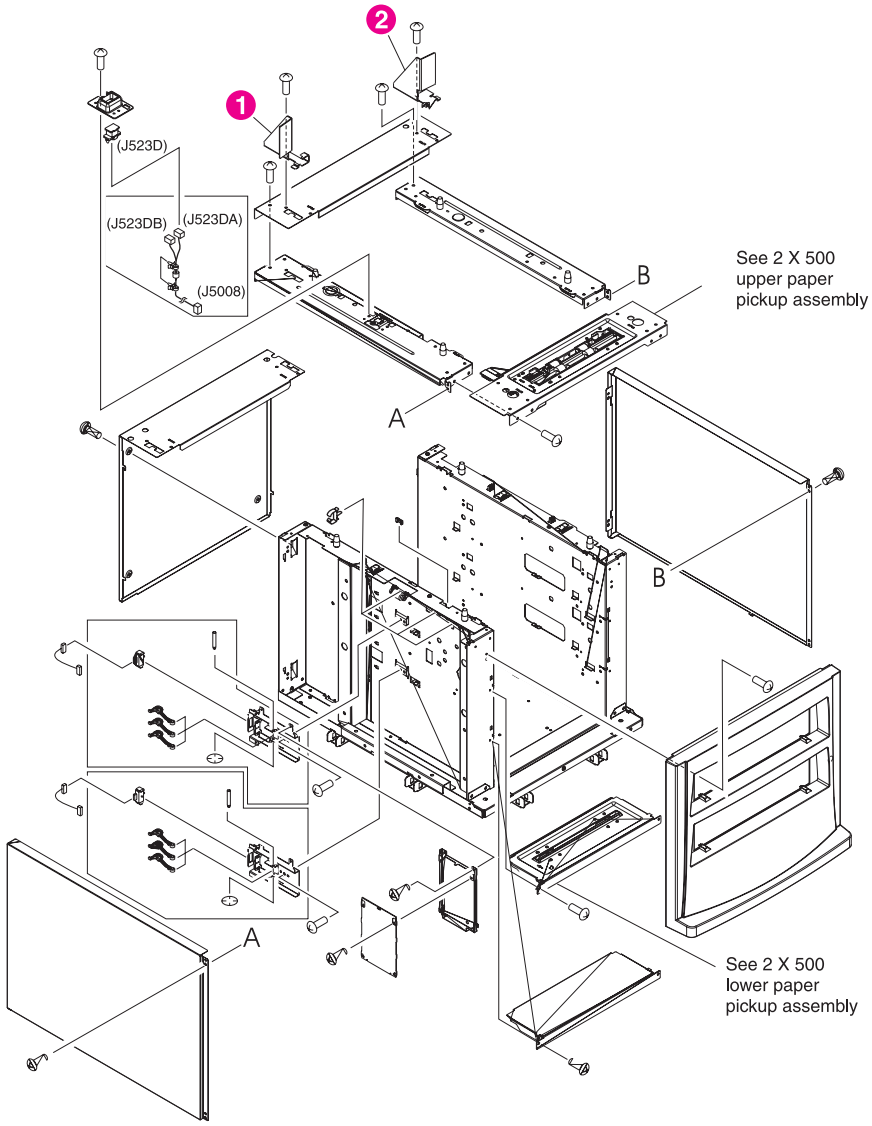


Figure 8-20 2 x 500-sheet feeder internal components (1 of 2) (HP CLJ 4650 models only)

Table 8-22 2 x 500-sheet feeder internal components (1 of 2) (HP CLJ 4650 models only)

Ref	Description	Part number	Qty
1	Fixed-level left plate (secures the printer to the feeder); **4650 Only**	RB3-0978-000CN	1
2	Fixed-level right plate (secures the printer to the feeder); **4650 Only**	RB3-0979-000CN	1

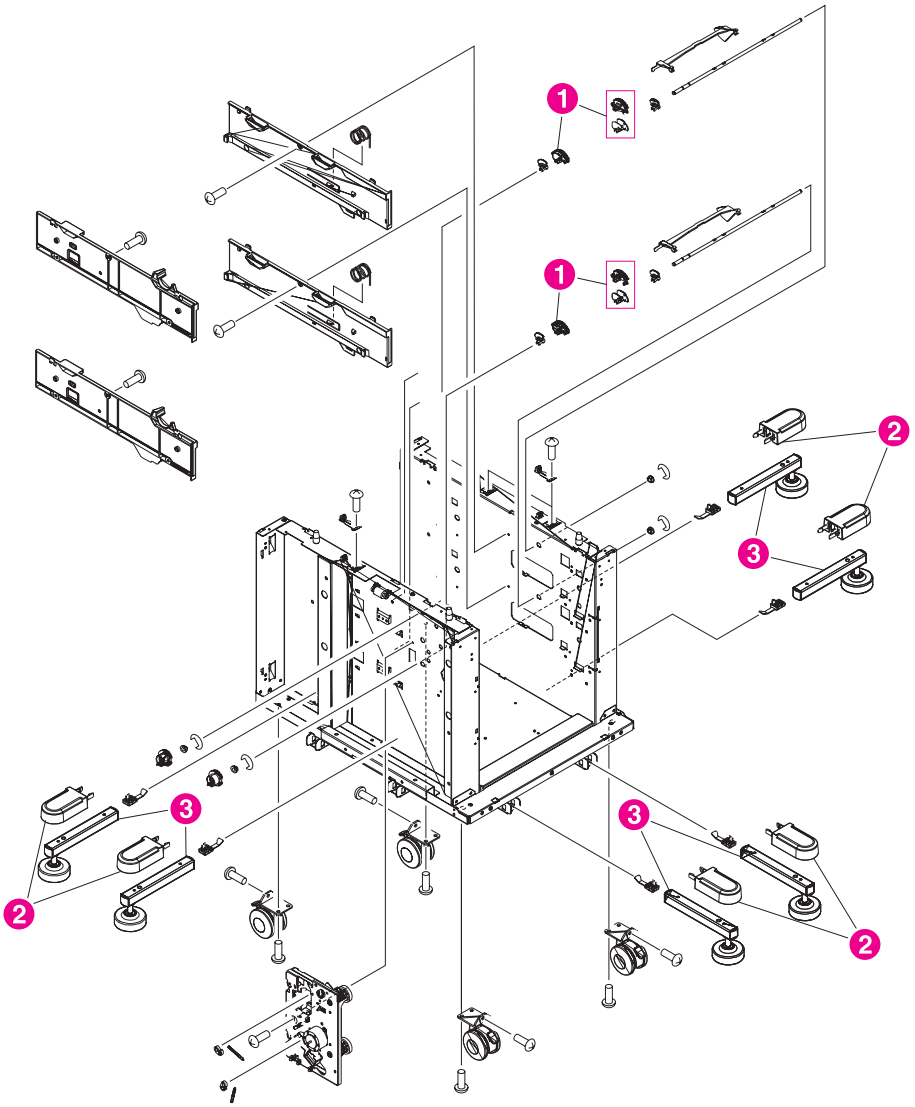


Figure 8-21 2 x 500-sheet feeder internal components (2 of 2) (HP CLJ 4650 models only)

Table 8-23 2 x 500-sheet feeder internal components (2 of 2) (HP CLJ 4650 models only)

Ref	Description	Part number	Qty
1	Paper pickup rollers; **4650 Only**	RF5-3739-000CN	2
2	Adjuster cover; **4650 Only**	RB2-3691-000CN	6
3	Outrigger assembly; **4650 Only**	RG5-7523-000CN	6

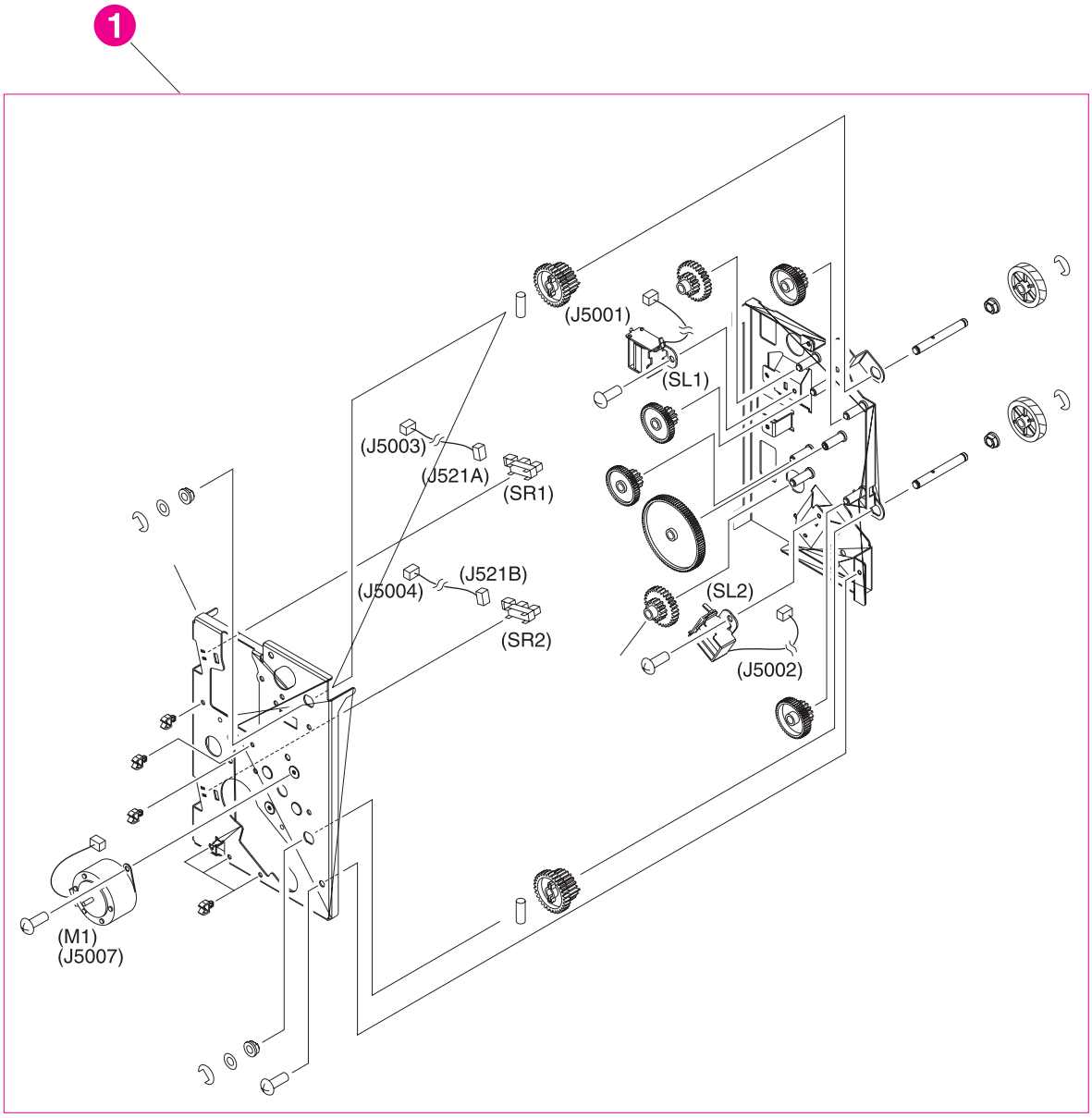


Figure 8-22 2 x 500-sheet feeder paper pickup drive assembly (HP CLJ 4650 models only)

Table 8-24 2 x 500-sheet feeder paper pickup drive assembly (HP CLJ 4650 models only)

Ref	Description	Part number	Qty
1	2 x 500-sheet paper pickup feeder drive assembly; **4650 Only**	RG5-7531-000CN	1

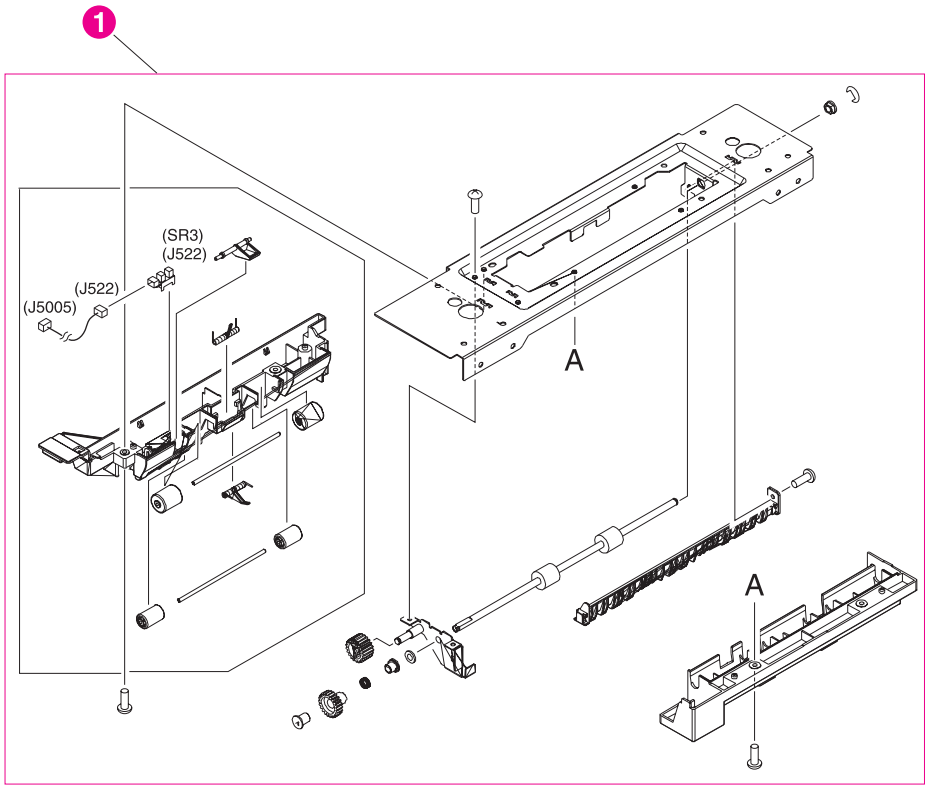


Figure 8-23 2 x 500-sheet feeder upper paper pickup assembly (HP CLJ 4650 models only)

Table 8-25 2 x 500-sheet feeder upper paper pickup assembly (HP CLJ 4650 models only)

Ref	Description	Part number	Qty
1	2 x 500-sheet feeder upper paper pickup assembly; **4650 Only**	RG5-7529-000CN	1

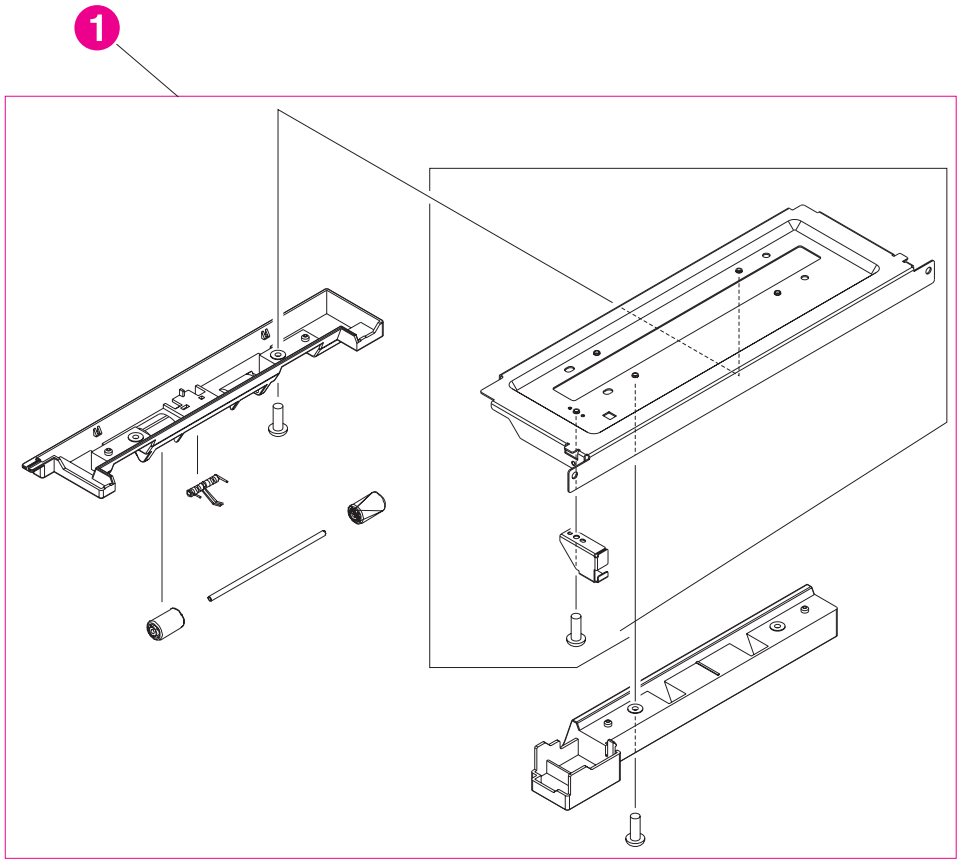


Figure 8-24 2 x 500-sheet feeder lower paper pickup assembly (HP CLJ 4650 models only)

Table 8-26 2 x 500-sheet feeder lower paper pickup assembly (HP CLJ 4650 models only)

Ref	Description	Part number	Qty
1	2 x 500-sheet feeder lower paper pickup assembly; **4650 Only**	RG5-7530-000CN	1

Alphabetical parts list

Table 8-27 Alphabetical parts list

Description	Part number	Table and page
2 x 500 lower cassette; **4650 Only**	RG5-7534-000CN	2 x 500-sheet paper feeder (HP CLJ 4650 models only)
2 x 500 paper feeder driver PCA assembly; **4650 Only**	RG5-7518-000CN	2 x 500-sheet paper feeder (HP CLJ 4650 models only)
2 x 500 upper cassette; **4650 Only**	RG5-7535-000CN	2 x 500-sheet paper feeder (HP CLJ 4650 models only)
2 x 500-sheet feeder lower paper pickup assembly; **4650 Only**	RG5-7530-000CN	2 x 500-sheet feeder lower paper pickup assembly (HP CLJ 4650 models only)
2 x 500-sheet feeder upper paper pickup assembly; **4650 Only**	RG5-7529-000CN	2 x 500-sheet feeder upper paper pickup assembly (HP CLJ 4650 models only)
2 x 500-sheet feeder/tray assembly; **4650 Only**	Q3674-67901	2 x 500-sheet paper feeder (HP CLJ 4650 models only)
2 x 500-sheet paper pickup feeder drive assembly; **4650 Only**	RG5-7531-000CN	2 x 500-sheet feeder paper pickup drive assembly (HP CLJ 4650 models only)
500-sheet paper feeder and tray 3 assembly; **4600/4650 Only**	Q3673-67901	500-sheet paper feeder assembly
Adjuster cover; **4650 Only**	RB2-3691-000CN	2 x 500-sheet feeder internal components (2 of 2) (HP CLJ 4650 models only)
Antenna memory PCA assembly	RG5-6396-000CN	Internal components (1 of 5)
Arm, paper-size	RB2-8349-000CN	Cassette (tray 2)
Arm, pressure	RB2-8151-020CN	Internal components (3 of 5)
Arm, test print	RB2-8250-000CN	Internal components (1 of 5)
Bracket, sensor	RB2-8540-000CN	Internal components (5 of 5)
Cable, ac, 110 V	RG5-6427-000CN	Internal components (5 of 5)
Cable, ac, 220 V	RG5-6434-000CN	Internal components (5 of 5)
Cable, antenna	RG5-6418-000CN	Internal components (1 of 5)
Cable, cassette size	RG5-6431-000CN	Internal components (2 of 5)
Cable, cassette size (optional)	RG5-6430-000CN	Internal components (2 of 5)
Cable, dc power supply	RG5-6415-000CN	Internal components (5 of 5)
Cable, environment sensor; **4610n/4650 Only**	RG5-7471-000CN	Internal components (2 of 5)
Cable, flat	RH2-5471-000CN	Internal components (5 of 5)
Cable, interface	RG5-6422-000CN	Internal components (5 of 5)
Cable, left plate	RG5-6413-000CN	Internal components (3 of 5)

Table 8-27 Alphabetical parts list (continued)

Description	Part number	Table and page
Cable, memory; **4600 Only**	RG5-6420-000CN	Internal components (1 of 5)
Cable, paper-feed	RG5-6419-000CN	Paper pickup assembly
Cable, relay	RG5-6414-000CN	Internal components (5 of 5)
Cable, sensor	RG5-6423-000CN	Internal components (5 of 5)
Cable/connector, fuser; **4600 Only**	RG5-6425-000CN	Internal components (5 of 5)
Cable/connector, fuser; **4610n/4650 Only**	RG5-7480-000CN	Internal components (5 of 5)
Cable/connector, optional feeder	RG5-6430-000CN	Internal components (2 of 5)
Cam/gear 66T	RS7-0135-000CN	Internal components (5 of 5)
Cap, left	RB2-8121-000CN	Internal components (4 of 5)
Cap, right	RB2-8124-000CN	Internal components (4 of 5)
Cartridge, inlet assembly	RG5-6450-000CN	Internal components (3 of 5)
Cassette (tray 2); **4600 Only**	RG5-6476-090CN	Cassette (tray 2)
Cassette (tray 2); **4610n/4650 Only**	RG5-7459-000CN	Cassette (tray 2)
Cassette frame left assembly	RG5-6459-000CN	Internal components (2 of 5)
Cassette, 500-sheet paper feeder	RG1-4140-080CN	500-sheet paper feeder assembly
Cassette-frame right assembly	RG5-6460-000CN	Internal components (2 of 5)
Color-registration-detection assembly	RG5-6454-000CN	Internal components (4 of 5)
CompactFlash; **4610n Only**	Q2635–67919	Printer PCAs
CompactFlash; **4650 Only**	Q2635-67910	Printer PCAs
Connector, drawer	WS3-5746-000CN	Internal components (3 of 5)
Contact-pin assembly	RG5-6492-000CN	Internal components (1 of 5)
Control-panel assembly, 110 V; **4600 Only**	RG5-6432-040CN	Internal components (1 of 5)
Control-panel assembly, 220 V; **4600 Only**	RG5-6433-040CN	Internal components (1 of 5)
Control-panel cross-member assembly	RG5-6510-000CN	Internal components (1 of 5)
Cover, cartridge; **4610n/4650 Only**	RB2-8196-000CN	Internal components (2 of 5)
Cover, sensor	RB2-8541-000CN	Internal components (5 of 5)
Damper assembly (top cover hinge)	RG5-6446-000CN	Internal components (4 of 5)
DC controller PCA (exchange); **4600 Only**	C9660-69020	Printer PCAs
DC controller PCA (new); **4600 Only**	RG5-6391-100CN	Printer PCAs
DC controller PCA assembly; **4600 Only**	RG5-6391-000CN	Internal components (3 of 5)
DC controller PCA assembly; **4610n/4650 Only**	RG5-7470-000CN	Internal components (3 of 5)
DC controller PCA; **4610n/4650 Only**	RG5-7470-030CN	Printer PCAs
Developing disengaging drive assembly	RG5-6507-000CN	Internal components (4 of 5)

Table 8-27 Alphabetical parts list (continued)

Description	Part number	Table and page
Disengaging drive assembly	RG5-6507-020CN	Disengaging drive assembly
Drum drive assembly (black)	RG5-7468-000CN	Internal components (1 of 5)
Drum drive assembly (black)	RG5-7468-000CN	Drum drive assembly
Drum drive assembly (cyan and magenta)	RG5-7467-000CN	Internal components (1 of 5)
Drum drive assembly (cyan/magenta)	RG5-7467-000CN	Drum drive assembly
Drum drive assembly (yellow)	RG5-7469-000CN	Internal components (1 of 5)
Drum drive assembly (yellow)	RG5-7469-000CN	Drum drive assembly
Drum-grounding assembly (black and yellow), short	RG5-6474-000CN	Internal components (1 of 5)
Drum-grounding assembly (cyan and magenta), long	RG5-7362-000CN	Internal components (1 of 5)
Environment/humidity sensor; **4610n/4650 Only**	WP2-5138-000CN	Internal components (2 of 5)
ETB assembly; **4600 Only**	RG5-6484-070CN	ETB assembly
ETB assembly; **4600 Only**	RG5-6484-040CN	Internal components (4 of 5)
ETB assembly; **4610n/4650 Only**	RG5-7455-000CN	Internal components (4 of 5)
ETB assembly; **4610n/4650 Only**	RG5-7455-000CN	ETB assembly
ETB latch assembly	RG5-6456-000CN	Internal components (3 of 5)
Fan, cartridge	RH7-1491-000CN	Internal components (3 of 5)
Fan, formatter	RH7-1490-000CN	Internal components (3 of 5)
Fan, lower (power-supply fan); **4610n/4650 Only**	RH7-1607-000CN	Internal components (3 of 5)
Filter, left side	RB3-0607-000CN	External covers and panels
Filter, rear	RB2-8596-000CN	External covers and panels
Firmware DIMM; **4600 Only**	C9712-67908	Printer PCAs
Fixed-level left plate (secures the printer to the feeder); **4650 Only**	RB3-0978-000CN	2 x 500-sheet feeder internal components (1 of 2) (HP CLJ 4650 models only)
Fixed-level right plate (secures the printer to the feeder); **4650 Only**	RB3-0979-000CN	2 x 500-sheet feeder internal components (1 of 2) (HP CLJ 4650 models only)
Formatter simplex/duplex, exchange; **4650 Only**	Q3999-69002	Printer PCAs
Formatter simplex/duplex, new; **4650 Only**	Q3999-67902	Printer PCAs
Formatter, duplex, exchange; **4600 Only**	C9661-69002	Printer PCAs
Formatter, duplex, new; **4600 Only**	C9660-67902	Printer PCAs
Formatter, simplex, exchange; **4600 Only**	C9660-69011	Printer PCAs
Formatter, simplex, exchange; **4610n Only**	Q7732–69001	Printer PCAs
Formatter, simplex, new; **4600 Only**	C9660-67901	Printer PCAs
Formatter, simplex, new; **4610n Only**	Q7732–67901	Printer PCAs
Front cover assembly	RG5-6466-000CN	External covers and panels

Table 8-27 Alphabetical parts list (continued)

Description	Part number	Table and page
Fuse, 125 V, 6.3 A, 110 V	VD7-2356-301CN	Internal components (5 of 5)
Fuse, 250 V, 20 A, 110 V	VD7-1732-002CN	Internal components (5 of 5)
Fuse, 250 V, 4 A, 220 V	VD7-0644-001CN	Internal components (5 of 5)
Fuse, 250 V, 8 A, 220 V	VD7-1838-001CN	Internal components (5 of 5)
Fuser 220, V; **4600 Only**	RG5-6517-110CN	Internal components (4 of 5)
Fuser assembly, 110 V; **4600 Only**	RG5-6493-190CN **4600 Only**	Fuser assembly
Fuser assembly, 110 V; **4610n/4650 Only**	RG5-7450-110CN	Fuser assembly
Fuser assembly, 220 V; **4600 Only**	RG5-6517-110CN	Fuser assembly
Fuser assembly, 220 V; **4610n/4650 Only**	RG5-7451-110CN	Fuser assembly
Fuser cover, left	RF5-3774-030CN	Fuser assembly
Fuser cover, right	RF5-3775-030CN	Fuser assembly
Fuser drive assembly; **4600 Only**	RG5-6512-000CN	Fuser drive assembly
Fuser drive assembly; **4600 Only**	RG5-6512-000CN	Internal components (4 of 5)
Fuser drive assembly; **4610n/4650 Only**	RG5-7452-000CN	Internal components (4 of 5)
Fuser drive assembly; **4610n/4650 Only**	RG5-7452-000CN	Fuser drive assembly
Fuser power-supply PCA 110 V	RG5-6399-030CN	Printer PCAs
Fuser power-supply PCA 220 V	RG5-6400-030CN	Printer PCAs
Fuser power-supply PCA, 110 V	RG5-6399-030CN	Internal components (5 of 5)
Fuser power-supply PCA, 220 V	RG5-6400-050CN	Internal components (5 of 5)
Fuser, 110 V **4600 Only**	RG5-6493-190CN	Internal components (4 of 5)
Fuser, 110 V; **4610n/4650 Only**	RG5-7450-110CN	Internal components (4 of 5)
Fuser, 220 V; **4610n/4650 Only**	RG5-7451-000CN	Internal components (4 of 5)
Gear 17T	RS7-0139-000CN	Internal components (1 of 5)
Gear 200T (black and yellow)	RS7-0138-000CN	Internal components (1 of 5)
Gear 200T (cyan and magenta)	RS7-0137-000CN	Internal components (1 of 5)
Gear 29T	RS7-0136-020CN	Internal components (5 of 5)
Gear, pressure	RB2-8122-020CN	Internal components (5 of 5)
High-voltage power-supply PCA (exchange)	C9660-69022	Printer PCAs
High-voltage power-supply PCA (new)	RG5-6395-000CN	Printer PCAs
High-voltage power-supply PCA assembly (exchange)	C9660-69022	Internal components (3 of 5)
High-voltage power-supply PCA assembly (new)	RG5-6395-000CN	Internal components (3 of 5)
HVT terminal assembly	RG5-6449-000CN	Internal components (3 of 5)
Laser/scanner assembly **4610n/4650 Only**	RG5-7475-000CN	Internal components (4 of 5)

Table 8-27 Alphabetical parts list (continued)

Description	Part number	Table and page
Laser/scanner assembly; **4600 Only**	RG5-6390-000CN	Internal components (4 of 5)
LED PCA assembly	RG5-6394-000CN	Drum drive assembly
Left cover	RB2-8590-040CN	External covers and panels
Lever, cartridge pressure	RB2-8195-000CN	Internal components (2 of 5)
Low-voltage power supply, 110 V (exchange)	C9660-69023	Printer PCAs
Low-voltage power supply, 110 V (new)	RG5-6410-020CN	Printer PCAs
Low-voltage power supply, 220 V	RG5-6411-020CN	Printer PCAs
Low-voltage power-supply assembly, 110 V	RG5-6410-020CN	Internal components (5 of 5)
Low-voltage power-supply assembly, 220 V	RG5-6411-020CN	Internal components (5 of 5)
Memory controller PCA	RG5-6396-000CN	Printer PCAs
Memory tag antenna PCA	RG5-5469-000CN	Printer PCAs
Memory-tag-antenna PCA assembly	RG5-5469-000CN	Internal components (5 of 5)
Microswitch, front cover	WC4-5169-000CN	Internal components (3 of 5)
Motor, M6, ETB, DC, brushless, 24 V **4600 Only**	RH7-1495-000CN	ETB assembly
Motor, M6, ETB, DC, brushless, 24 V; **4610n/4650 Only**	RH7-1605-000CN	ETB assembly
Motor, M7, developing disengaging stepping	RH7-1494-000CN	Disengaging drive assembly
Motor, M8, fuser, DS, brushless, 24 V **4600 Only**	RH7-1495-000CN	Fuser drive assembly
Motor, M8, fuser, DS, brushless, 24 V; **4610n/4650 Only**	RH7-1605-000CN	Fuser drive assembly
Multipurpose tray assembly (tray 1)	RG5-6467-000CN	External covers and panels
Multipurpose tray pickup roller assembly	RG9-1529-000CN	Cassette (tray 2)
Operational-panel assembly, 110 V; **4610n/4650 Only**	RG5–6432–040CN	Internal components (1 of 5)
Outrigger assembly; **4650 Only**	RG5-7523-000CN	2 x 500-sheet feeder internal components (2 of 2) (HP CLJ 4650 models only)
Paper feeder drive assembly; **4600 Only**	RG1-4138-020CN	500-sheet paper feeder internal components
Paper feeder drive assembly; **4610n/4650 Only**	RG5-7541-000CN	500-sheet paper feeder internal components
Paper feeder PCA assembly; **4600 Only**	RG1-4139-000CN	500-sheet paper feeder internal components
Paper feeder PCA assembly; **4610n/4650 Only**	RG5-7542-000CN	500-sheet paper feeder internal components
Paper pickup assembly; **4600 Only**	RG5-6469-000CN	Paper pickup-drive assembly
Paper pickup assembly; **4600 Only**	RG5-6468-040CN	Paper pickup assembly
Paper pickup assembly; **4600 Only**	RG5-6468-000CN	Internal components (4 of 5)
Paper pickup assembly; **4610n/4650 Only**	RG5-7453-000CN	Internal components (4 of 5)
Paper pickup assembly; **4610n/4650 Only**	RG5-7466-000CN	Paper pickup-drive assembly

Table 8-27 Alphabetical parts list (continued)

Description	Part number	Table and page
Paper pickup assembly; **4610n/4650 Only**	RG5-7453-040CN	Paper pickup assembly
Paper pickup drive assembly; **4600 Only**	RG5-6469-000CN	Paper pickup assembly
Paper pickup drive assembly; **4610n/4650 Only**	RG5-7466-000CN	Paper pickup assembly
Paper pickup PCA	RG5-6392-000CN	Printer PCAs
Paper pickup rollers; **4650 Only**	RF5-3739-000CN	2 x 500-sheet feeder internal components (2 of 2) (HP CLJ 4650 models only)
Paper-sensor PCA assembly	RG5-6392-000CN	Paper pickup assembly
Photo interrupter, TLP1241	WG8-5362-000CN	Internal components (5 of 5)
Photo interrupter, TLP1241	WG8-5362-000CN	Internal components (5 of 5)
Photo interrupter, TLP1241	WG8-5362-000CN	Disengaging drive assembly
Photo interrupter, TLP1241	WG8-5362-000CN	Fuser drive assembly
Photo interrupter, TLP1241	WG8-5362-000CN	ETB assembly
Plate, developer disengagement (change plate)	RB2-8239-000CN	Internal components (1 of 5)
Plate, drive grounding	RB2-8255-000CN	Internal components (1 of 5)
Plate, drive interlock	RB2-8225-000CN	Internal components (1 of 5)
Plate, grounding	RB2-8542-000CN	Internal components (5 of 5)
Plate, separation assembly	RF5-3749-000CN	Cassette (tray 2)
Rear cover assembly	RG5-8592-000CN	External covers and panels
Rear cover, lower	RB2–8593–000CN	External covers and panels
Rear top cover assembly	RG5-6464-000CN	External covers and panels
Right cover	RB2–8591–000CN	External covers and panels
Rod, spring	RB2-8213-000CN	Internal components (2 of 5)
Rod, spring	RB2-8213-000CN	Internal components (2 of 5)
Roller, oblique	RB1-2155-000CN	ETB assembly
Roller, paper pickup	RF5-3739-000CN	Paper pickup assembly
Roller, paper pickup	RF5-3739-000CN	500-sheet paper feeder internal components
Sensor flag	RB2-8498-030CN	Fuser assembly
Separation pad	RF5-3750-020CN	Cassette (tray 2)
Solenoid	RH7-5319-000C	Paper pickup-drive assembly
Spring tension	RS6-2537-000CN	Internal components (1 of 5)
Spring, scanner support	RB2-8246-000CN	Internal components (5 of 5)
Spring, tension	RS6-2511-000CN	Internal components (3 of 5)
Spring, tension	RS6-2511-000CN	Internal components (4 of 5)

Table 8-27 Alphabetical parts list (continued)

Description	Part number	Table and page
Spring, tension	RS6-2510-000CN	Internal components (5 of 5)
Static eliminator; **4600 Only**	RF5-3773-000CN	Internal components (4 of 5)
Switch, cassette paper size	WC2-5452-000CN	Internal components (2 of 5)
Switch, push	WC2-5452-000CN	Internal components (2 of 5)
Toner sensor PCA	RG5-6393-000CN	Printer PCAs
Toner-sensor PCA	RG5-6393-000CN	Internal components (3 of 5)
Top cover assembly	RG5-6465-000CN	External covers and panels

Numerical parts list

Table 8-28 Numerical parts list

Part number	Description	Table and page
C9660-67901	Formatter, simplex, new; **4600 Only**	Printer PCAs
C9660-67902	Formatter, duplex, new; **4600 Only**	Printer PCAs
C9660-69011	Formatter, simplex, exchange; **4600 Only**	Printer PCAs
C9660-69020	DC controller PCA (exchange); **4600 Only**	Printer PCAs
C9660-69022	High-voltage power-supply PCA (exchange)	Printer PCAs
C9660-69022	High-voltage power-supply PCA assembly (exchange)	Internal components (3 of 5)
C9660-69023	Low-voltage power supply, 110 V (exchange)	Printer PCAs
C9661-69002	Formatter, duplex, exchange; **4600 Only**	Printer PCAs
C9712-67908	Firmware DIMM; **4600 Only**	Printer PCAs
Q2635-67910	CompactFlash; **4650 Only**	Printer PCAs
Q2635–67919	CompactFlash; **4610n Only**	Printer PCAs
Q3673-67901	500-sheet paper feeder and tray 3 assembly; **4600/4650 Only**	500-sheet paper feeder assembly
Q3674-67901	2 x 500-sheet feeder/tray assembly; **4650 Only**	2 x 500-sheet paper feeder (HP CLJ 4650 models only)
Q3999-67902	Formatter simplex/duplex, new; **4650 Only**	Printer PCAs
Q3999-69002	Formatter simplex/duplex, exchange; **4650 Only**	Printer PCAs
Q7732–67901	Formatter, simplex, new; **4610n Only**	Printer PCAs
Q7732–69001	Formatter, simplex, exchange; **4610n Only**	Printer PCAs
RB1-2155-000CN	Roller, oblique	ETB assembly
RB2-3691-000CN	Adjuster cover; **4650 Only**	2 x 500-sheet feeder internal components (2 of 2) (HP CLJ 4650 models only)
RB2-8121-000CN	Cap, left	Internal components (4 of 5)
RB2-8122-020CN	Gear, pressure	Internal components (5 of 5)
RB2-8124-000CN	Cap, right	Internal components (4 of 5)
RB2-8151-020CN	Arm, pressure	Internal components (3 of 5)
RB2-8195-000CN	Lever, cartridge pressure	Internal components (2 of 5)
RB2-8196-000CN	Cover, cartridge; **4610n/4650 Only**	Internal components (2 of 5)
RB2-8213-000CN	Rod, spring	Internal components (2 of 5)
RB2-8213-000CN	Rod, spring	Internal components (2 of 5)
RB2-8225-000CN	Plate, drive interlock	Internal components (1 of 5)
RB2-8239-000CN	Plate, developer disengagement (change plate)	Internal components (1 of 5)

Table 8-28 Numerical parts list (continued)

Part number	Description	Table and page
RB2-8246-000CN	Spring, scanner support	Internal components (5 of 5)
RB2-8250-000CN	Arm, test print	Internal components (1 of 5)
RB2-8255-000CN	Plate, drive grounding	Internal components (1 of 5)
RB2-8349-000CN	Arm, paper-size	Cassette (tray 2)
RB2-8498-030CN	Sensor flag	Fuser assembly
RB2-8540-000CN	Bracket, sensor	Internal components (5 of 5)
RB2-8541-000CN	Cover, sensor	Internal components (5 of 5)
RB2-8542-000CN	Plate, grounding	Internal components (5 of 5)
RB2-8590-040CN	Left cover	External covers and panels
RB2-8596-000CN	Filter, rear	External covers and panels
RB2–8591–000CN	Right cover	External covers and panels
RB2–8593–000CN	Rear cover, lower	External covers and panels
RB3-0607-000CN	Filter, left side	External covers and panels
RB3-0978-000CN	Fixed-level left plate (secures the printer to the feeder); **4650 Only**	2 x 500-sheet feeder internal components (1 of 2) (HP CLJ 4650 models only)
RB3-0979-000CN	Fixed-level right plate (secures the printer to the feeder); **4650 Only**	2 x 500-sheet feeder internal components (1 of 2) (HP CLJ 4650 models only)
RF5-3739-000CN	Roller, paper pickup	Paper pickup assembly
RF5-3739-000CN	Roller, paper pickup	500-sheet paper feeder internal components
RF5-3739-000CN	Paper pickup rollers; **4650 Only**	2 x 500-sheet feeder internal components (2 of 2) (HP CLJ 4650 models only)
RF5-3749-000CN	Plate, separation assembly	Cassette (tray 2)
RF5-3750-020CN	Separation pad	Cassette (tray 2)
RF5-3773-000CN	Static eliminator; **4600 Only**	Internal components (4 of 5)
RF5-3774-030CN	Fuser cover, left	Fuser assembly
RF5-3775-030CN	Fuser cover, right	Fuser assembly
RG1-4138-020CN	Paper feeder drive assembly; **4600 Only**	500-sheet paper feeder internal components
RG1-4139-000CN	Paper feeder PCA assembly; **4600 Only**	500-sheet paper feeder internal components
RG1-4140-080CN	Cassette, 500-sheet paper feeder	500-sheet paper feeder assembly
RG5-5469-000CN	Memory tag antenna PCA	Printer PCAs
RG5-5469-000CN	Memory-tag-antenna PCA assembly	Internal components (5 of 5)

Table 8-28 Numerical parts list (continued)

Part number	Description	Table and page
RG5-6390-000CN	Laser/scanner assembly; **4600 Only**	Internal components (4 of 5)
RG5-6391-000CN	DC controller PCA assembly; **4600 Only**	Internal components (3 of 5)
RG5-6391-100CN	DC controller PCA (new); **4600 Only**	Printer PCAs
RG5-6392-000CN	Paper pickup PCA	Printer PCAs
RG5-6392-000CN	Paper-sensor PCA assembly	Paper pickup assembly
RG5-6393-000CN	Toner sensor PCA	Printer PCAs
RG5-6393-000CN	Toner-sensor PCA	Internal components (3 of 5)
RG5-6394-000CN	LED PCA assembly	Drum drive assembly
RG5-6395-000CN	High-voltage power-supply PCA (new)	Printer PCAs
RG5-6395-000CN	High-voltage power-supply PCA assembly (new)	Internal components (3 of 5)
RG5-6396-000CN	Memory controller PCA	Printer PCAs
RG5-6396-000CN	Antenna memory PCA assembly	Internal components (1 of 5)
RG5-6399-030CN	Fuser power-supply PCA 110 V	Printer PCAs
RG5-6399-030CN	Fuser power-supply PCA, 110 V	Internal components (5 of 5)
RG5-6400-030CN	Fuser power-supply PCA 220 V	Printer PCAs
RG5-6400-050CN	Fuser power-supply PCA, 220 V	Internal components (5 of 5)
RG5-6410-020CN	Low-voltage power supply, 110 V (new)	Printer PCAs
RG5-6410-020CN	Low-voltage power-supply assembly, 110 V	Internal components (5 of 5)
RG5-6411-020CN	Low-voltage power supply, 220 V	Printer PCAs
RG5-6411-020CN	Low-voltage power-supply assembly, 220 V	Internal components (5 of 5)
RG5-6413-000CN	Cable, left plate	Internal components (3 of 5)
RG5-6414-000CN	Cable, relay	Internal components (5 of 5)
RG5-6415-000CN	Cable, dc power supply	Internal components (5 of 5)
RG5-6418-000CN	Cable, antenna	Internal components (1 of 5)
RG5-6419-000CN	Cable, paper-feed	Paper pickup assembly
RG5-6420-000CN	Cable, memory; **4600 Only**	Internal components (1 of 5)
RG5-6422-000CN	Cable, interface	Internal components (5 of 5)
RG5-6423-000CN	Cable, sensor	Internal components (5 of 5)
RG5-6425-000CN	Cable/connector, fuser; **4600 Only**	Internal components (5 of 5)
RG5-6427-000CN	Cable, ac, 110 V	Internal components (5 of 5)
RG5-6430-000CN	Cable/connector, optional feeder	Internal components (2 of 5)
RG5-6430-000CN	Cable, cassette size (optional)	Internal components (2 of 5)
RG5-6431-000CN	Cable, cassette size	Internal components (2 of 5)
RG5-6432-040CN	Control-panel assembly, 110 V; **4600 Only**	Internal components (1 of 5)

Table 8-28 Numerical parts list (continued)

Part number	Description	Table and page
RG5-6433-040CN	Control-panel assembly, 220 V; **4600 Only**	Internal components (1 of 5)
RG5-6434-000CN	Cable, ac, 220 V	Internal components (5 of 5)
RG5-6446-000CN	Damper assembly (top cover hinge)	Internal components (4 of 5)
RG5-6449-000CN	HVT terminal assembly	Internal components (3 of 5)
RG5-6450-000CN	Cartridge, inlet assembly	Internal components (3 of 5)
RG5-6454-000CN	Color-registration-detection assembly	Internal components (4 of 5)
RG5-6456-000CN	ETB latch assembly	Internal components (3 of 5)
RG5-6459-000CN	Cassette frame left assembly	Internal components (2 of 5)
RG5-6460-000CN	Cassette-frame right assembly	Internal components (2 of 5)
RG5-6464-000CN	Rear top cover assembly	External covers and panels
RG5-6465-000CN	Top cover assembly	External covers and panels
RG5-6466-000CN	Front cover assembly	External covers and panels
RG5-6467-000CN	Multipurpose tray assembly (tray 1)	External covers and panels
RG5-6468-000CN	Paper pickup assembly; **4600 Only**	Internal components (4 of 5)
RG5-6468-040CN	Paper pickup assembly; **4600 Only**	Paper pickup assembly
RG5-6469-000CN	Paper pickup assembly; **4600 Only**	Paper pickup-drive assembly
RG5-6469-000CN	Paper pickup drive assembly; **4600 Only**	Paper pickup assembly
RG5-6474-000CN	Drum-grounding assembly (black and yellow), short	Internal components (1 of 5)
RG5-6476-090CN	Cassette (tray 2); **4600 Only**	Cassette (tray 2)
RG5-6484-040CN	ETB assembly; **4600 Only**	Internal components (4 of 5)
RG5-6484-070CN	ETB assembly; **4600 Only**	ETB assembly
RG5-6492-000CN	Contact-pin assembly	Internal components (1 of 5)
RG5-6493-190CN	Fuser, 110 V **4600 Only**	Internal components (4 of 5)
RG5-6493-190CN **4600 Only**	Fuser assembly, 110 V; **4600 Only**	Fuser assembly
RG5-6507-000CN	Developing disengaging drive assembly	Internal components (4 of 5)
RG5-6507-020CN	Disengaging drive assembly	Disengaging drive assembly
RG5-6510-000CN	Control-panel cross-member assembly	Internal components (1 of 5)
RG5-6512-000CN	Fuser drive assembly; **4600 Only**	Internal components (4 of 5)
RG5-6512-000CN	Fuser drive assembly; **4600 Only**	Fuser drive assembly
RG5-6517-110CN	Fuser 220, V; **4600 Only**	Internal components (4 of 5)
RG5-6517-110CN	Fuser assembly, 220 V; **4600 Only**	Fuser assembly
RG5-7362-000CN	Drum-grounding assembly (cyan and magenta), long	Internal components (1 of 5)
RG5-7450-110CN	Fuser, 110 V; **4610n/4650 Only**	Internal components (4 of 5)

Table 8-28 Numerical parts list (continued)

Part number	Description	Table and page
RG5-7450-110CN	Fuser assembly, 110 V; **4610n/4650 Only**	Fuser assembly
RG5-7451-000CN	Fuser, 220 V; **4610n/4650 Only**	Internal components (4 of 5)
RG5-7451-110CN	Fuser assembly, 220 V; **4610n/4650 Only**	Fuser assembly
RG5-7452-000CN	Fuser drive assembly; **4610n/4650 Only**	Internal components (4 of 5)
RG5-7452-000CN	Fuser drive assembly; **4610n/4650 Only**	Fuser drive assembly
RG5-7453-000CN	Paper pickup assembly; **4610n/4650 Only**	Internal components (4 of 5)
RG5-7453-040CN	Paper pickup assembly; **4610n/4650 Only**	Paper pickup assembly
RG5-7455-000CN	ETB assembly; **4610n/4650 Only**	Internal components (4 of 5)
RG5-7455-000CN	ETB assembly; **4610n/4650 Only**	ETB assembly
RG5-7459-000CN	Cassette (tray 2); **4610n/4650 Only**	Cassette (tray 2)
RG5-7466-000CN	Paper pickup assembly; **4610n/4650 Only**	Paper pickup-drive assembly
RG5-7466-000CN	Paper pickup drive assembly; **4610n/4650 Only**	Paper pickup assembly
RG5-7467-000CN	Drum drive assembly (cyan and magenta)	Internal components (1 of 5)
RG5-7467-000CN	Drum drive assembly (cyan/magenta)	Drum drive assembly
RG5-7468-000CN	Drum drive assembly (black)	Internal components (1 of 5)
RG5-7468-000CN	Drum drive assembly (black)	Drum drive assembly
RG5-7469-000CN	Drum drive assembly (yellow)	Internal components (1 of 5)
RG5-7469-000CN	Drum drive assembly (yellow)	Drum drive assembly
RG5-7470-000CN	DC controller PCA assembly; **4610n/4650 Only**	Internal components (3 of 5)
RG5-7470-030CN	DC controller PCA; **4610n/4650 Only**	Printer PCAs
RG5-7471-000CN	Cable, environment sensor; **4610n/4650 Only**	Internal components (2 of 5)
RG5-7475-000CN	Laser/scanner assembly **4610n/4650 Only**	Internal components (4 of 5)
RG5-7480-000CN	Cable/connector, fuser; **4610n/4650 Only**	Internal components (5 of 5)
RG5-7518-000CN	2 x 500 paper feeder driver PCA assembly; **4650 Only**	2 x 500-sheet paper feeder (HP CLJ 4650 models only)
RG5-7523-000CN	Outrigger assembly; **4650 Only**	2 x 500-sheet feeder internal components (2 of 2) (HP CLJ 4650 models only)
RG5-7529-000CN	2 x 500-sheet feeder upper paper pickup assembly; **4650 Only**	2 x 500-sheet feeder upper paper pickup assembly (HP CLJ 4650 models only)
RG5-7530-000CN	2 x 500-sheet feeder lower paper pickup assembly; **4650 Only**	2 x 500-sheet feeder lower paper pickup assembly (HP CLJ 4650 models only)
RG5-7531-000CN	2 x 500-sheet paper pickup feeder drive assembly; **4650 Only**	2 x 500-sheet feeder paper pickup drive assembly (HP CLJ 4650 models only)
RG5-7534-000CN	2 x 500 lower cassette; **4650 Only**	2 x 500-sheet paper feeder (HP CLJ 4650 models only)

Table 8-28 Numerical parts list (continued)

Part number	Description	Table and page
RG5-7535-000CN	2 x 500 upper cassette; **4650 Only**	2 x 500-sheet paper feeder (HP CLJ 4650 models only)
RG5-7541-000CN	Paper feeder drive assembly; **4610n/4650 Only**	500-sheet paper feeder internal components
RG5-7542-000CN	Paper feeder PCA assembly; **4610n/4650 Only**	500-sheet paper feeder internal components
RG5-8592-000CN	Rear cover assembly	External covers and panels
RG5–6432–040CN	Operational-panel assembly, 110 V; **4610n/4650 Only**	Internal components (1 of 5)
RG9-1529-000CN	Multipurpose tray pickup roller assembly	Cassette (tray 2)
RH2-5471-000CN	Cable, flat	Internal components (5 of 5)
RH7-1490-000CN	Fan, formatter	Internal components (3 of 5)
RH7-1491-000CN	Fan, cartridge	Internal components (3 of 5)
RH7-1494-000CN	Motor, M7, developing disengaging stepping	Disengaging drive assembly
RH7-1495-000CN	Motor, M8, fuser, DS, brushless, 24 V **4600 Only**	Fuser drive assembly
RH7-1495-000CN	Motor, M6, ETB, DC, brushless, 24 V **4600 Only**	ETB assembly
RH7-1605-000CN	Motor, M8, fuser, DS, brushless, 24 V; **4610n/4650 Only**	Fuser drive assembly
RH7-1605-000CN	Motor, M6, ETB, DC, brushless, 24 V; **4610n/4650 Only**	ETB assembly
RH7-1607-000CN	Fan, lower (power-supply fan); **4610n/4650 Only**	Internal components (3 of 5)
RH7-5319-000C	Solenoid	Paper pickup-drive assembly
RS6-2510-000CN	Spring, tension	Internal components (5 of 5)
RS6-2511-000CN	Spring, tension	Internal components (3 of 5)
RS6-2511-000CN	Spring, tension	Internal components (4 of 5)
RS6-2537-000CN	Spring tension	Internal components (1 of 5)
RS7-0135-000CN	Cam/gear 66T	Internal components (5 of 5)
RS7-0136-020CN	Gear 29T	Internal components (5 of 5)
RS7-0137-000CN	Gear 200T (cyan and magenta)	Internal components (1 of 5)
RS7-0138-000CN	Gear 200T (black and yellow)	Internal components (1 of 5)
RS7-0139-000CN	Gear 17T	Internal components (1 of 5)
VD7-0644-001CN	Fuse, 250 V, 4 A, 220 V	Internal components (5 of 5)
VD7-1732-002CN	Fuse, 250 V, 20 A, 110 V	Internal components (5 of 5)
VD7-1838-001CN	Fuse, 250 V, 8 A, 220 V	Internal components (5 of 5)
VD7-2356-301CN	Fuse, 125 V, 6.3 A, 110 V	Internal components (5 of 5)
WC2-5452-000CN	Switch, cassette paper size	Internal components (2 of 5)
WC2-5452-000CN	Switch, push	Internal components (2 of 5)
WC4-5169-000CN	Microswitch, front cover	Internal components (3 of 5)

Table 8-28 Numerical parts list (continued)

Part number	Description	Table and page
WG8-5362-000CN	Photo interrupter, TLP1241	Internal components (5 of 5)
WG8-5362-000CN	Photo interrupter, TLP1241	Internal components (5 of 5)
WG8-5362-000CN	Photo interrupter, TLP1241	Disengaging drive assembly
WG8-5362-000CN	Photo interrupter, TLP1241	Fuser drive assembly
WG8-5362-000CN	Photo interrupter, TLP1241	ETB assembly
WP2-5138-000CN	Environment/humidity sensor; **4610n/4650 Only**	Internal components (2 of 5)
WS3-5746-000CN	Connector, drawer	Internal components (3 of 5)

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